CITY OF HOBART

AGENDA

City Planning Committee Meeting

Open Portion

Monday, 14 January 2019

at 5:00 pm
Lady Osborne Room, Town Hall

THE MISSION

Our mission is to ensure good governance of our capital City.

THE VALUES

The Council is:

about people	We value people – our community, our customers and colleagues.
professional	We take pride in our work.
enterprising	We look for ways to create value.
responsive	We're accessible and focused on service.
inclusive	We respect diversity in people and ideas.
making a difference	We recognise that everything we do shapes Hobart's future.

ORDER OF BUSINESS

Business listed on the agenda is to be conducted in the order in which it is set out, unless the committee by simple majority determines otherwise.

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City Planning Committee Meeting (Open Portion) held Monday, 14 January 2019 at 5:00 pm in the Lady Osborne Room, Town Hall.

COMMITTEE MEMBERS
Deputy Lord Mayor Burnet (Chairman)
Briscoe
Denison
Harvey
Behrakis

Apologies:

Leave of Absence: Nil.

NON-MEMBERS
Lord Mayor Reynolds
Zucco
Sexton
Thomas
Dutta
Ewin
Sherlock

1. CO-OPTION OF A COMMITTEE MEMBER IN THE EVENT OF A VACANCY

2. CONFIRMATION OF MINUTES

The minutes of the Open Portion of the City Planning Committee meeting held on Monday, 10 December 2018 and the Special City Planning Committee meeting held on Monday, 17 December 2018, are submitted for confirming as an accurate record.

3. CONSIDERATION OF SUPPLEMENTARY ITEMS

Ref: Part 2, Regulation 8(6) of the *Local Government (Meeting Procedures) Regulations 2015*.

Recommendation

That the Committee resolve to deal with any supplementary items not appearing on the agenda, as reported by the General Manager.

4. INDICATIONS OF PECUNIARY AND CONFLICTS OF INTEREST

Ref: Part 2, Regulation 8(7) of the *Local Government (Meeting Procedures) Regulations 2015*.

Members of the Committee are requested to indicate where they may have any pecuniary or conflict of interest in respect to any matter appearing on the agenda, or any supplementary item to the agenda, which the Committee has resolved to deal with.

5. TRANSFER OF AGENDA ITEMS

Regulation 15 of the *Local Government (Meeting Procedures) Regulations 2015*.

A Committee may close a part of a meeting to the public where a matter to be discussed falls within 15(2) of the above regulations.

In the event that the committee transfer an item to the closed portion, the reasons for doing so should be stated.

Are there any items which should be transferred from this agenda to the closed portion of the agenda, or from the closed to the open portion of the agenda?

6. PLANNING AUTHORITY ITEMS - CONSIDERATION OF ITEMS WITH DEPUTATIONS

In accordance with the requirements of Part 2 Regulation 8(3) of the *Local Government (Meeting Procedures) Regulations 2015*, the General Manager is to arrange the agenda so that the planning authority items are sequential.

In accordance with Part 2 Regulation 8(4) of the *Local Government (Meeting Procedures) Regulations 2015*, the Committee by simple majority may change the order of any of the items listed on the agenda, but in the case of planning items they must still be considered sequentially – in other words they still have to be dealt with as a single group on the agenda.

Where deputations are to be received in respect to planning items, past practice has been to move consideration of these items to the beginning of the meeting.

RECOMMENDATION

That in accordance with Regulation 8(4) of the *Local Government (Meeting Procedures) Regulations 2015*, the Committee resolve to deal with any items which have deputations by members of the public regarding any planning matter listed on the agenda, to be taken out of sequence in order to deal with deputations at the beginning of the meeting.

7. COMMITTEE ACTING AS PLANNING AUTHORITY

In accordance with the provisions of Part 2 Regulation 25 of the *Local Government (Meeting Procedures) Regulations 2015*, the intention of the Committee to act as a planning authority pursuant to the *Land Use Planning and Approvals Act 1993* is to be noted.

In accordance with Regulation 25, the Committee will act as a planning authority in respect to those matters appearing under this heading on the agenda, inclusive of any supplementary items.

The Committee is reminded that in order to comply with Regulation 25(2), the General Manager is to ensure that the reasons for a decision by a Council or Council Committee acting as a planning authority are recorded in the minutes.

7.1 APPLICATIONS UNDER THE SULLIVANS COVE PLANNING SCHEME 1997

7.1.1 34 DAVEY STREET, HOBART - PARTIAL DEMOLITION, ALTERATIONS AND EXTENSION TO PREVIOUSLY APPROVED DEVELOPMENT PLN-18-798 - FILE REF: F18/154094

Address:	34 Davey Street, Hobart
Proposal:	Partial Demolition, Alterations and Extension to Previously Approved Development
Expiry Date:	22 January 2019
Extension of Time:	Not applicable
Author:	Ben Ikin

RECOMMENDATION

That pursuant to the *Sullivans Cove Planning Scheme 1997*, the Council refuse the application for partial demolition, alterations and extension to previously approved development at 34 Davey Street, Hobart for the following reason:

1. The proposal does not meet the 'permitted' building or works' provision or the 'discretionary building or works provision at clauses 22.4.4 and 22.4.5 of the *Sullivans Cove Planning Scheme 1997* in relation to the listed place at 12 Murray Street because: (a) It does not complement and contribute to the cultural significance, character and appearance of the place; (b) It does not comply with the conservation strategy of the submitted Conservation Plan; and (c) The location, bulk and appearance of the proposed work will adversely affect the heritage values of the existing façade.

Attachment A:	PLN-18-798 - 34 DAVEY STREET HOBART TAS 7000 - Planning Committee or Delegated Report ⇩
Attachment B:	PLN-18-798 - 34 DAVEY STREET HOBART TAS 7000 - CPC Agenda Documents ⇩
Attachment C:	PLN-18-798 - 34 DAVEY STREET HOBART TAS 7000 - Planning Referral Officer Cultural Heritage Report ⇩

City of HOBART

APPLICATION UNDER SULLIVANS COVE PLANNING SCHEME 1997

Type of Report:	Committee
Council:	21 January 2019
Expiry Date:	22 January 2019
Application No:	PLN-18-798
Address:	34 DAVEY STREET , HOBART
Applicant:	(Citta Hobart Pty Ltd) 49a Davey Street
Proposal:	Partial Demolition, Alterations and Extension to Previously Approved Development
Representations:	Nil
Performance criteria:	Schedule 1 - Conservation of Cultural Heritage Values, Schedule 7 - Demolition

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1. Executive Summary

1.1 Planning approval is sought for Partial Demolition, Alterations and Extension to Previously Approved Development at 34 Davey Street (also known as Parliament Square).

1.2 More specifically the proposal is for an extension and alterations to the Murray Street wing of the Parliament Square development, to create an additional hotel floor and includes amendments to the roof structure. The maximum height of the extended building is 17.26m.

1.3 The proposal relies on performance criteria to satisfy the following standards and codes:

1.3.1 Schedule 1 - Conservation of Cultural Heritage Values

1.3.2 Schedule 7 - Demolition

1.4 No representations were received during the statutory advertising period between 16 and 30 November 2018.

1.5 The proposal is recommended for refusal on heritage grounds.

1.6 The final decision is delegated to the Council.

2. Site Detail

2.1 The site is 34 Davey Street, also known as Parliament Square, which is currently being redeveloped. It contains the completed Salamanca Office Building, and the remaining hotel and other commercial uses which are under construction. This application relates to the Murray Street wing of the development.

Figure 1: The site is bordered in blue. Note the image shows the Salamanca Office Building under construction, which is now completed, and it shows the building at 10 Murray Street in situ, which has now been demolished.

Figure 2: The location of the Murray Street wing, looking south east down Murray Street from Davey Street.

Figure 3: The location of the Murray Street wing, looking north west up Murray Street from opposite its intersection with Despard Street.

3. Proposal

3.1 Planning approval is sought for for Partial Demolition, Alterations and Extension to Previously Approved Development at 34 Davey Street (also known as Parliament Square).

3.2 More specifically the proposal is for an extension and alterations to the Murray Street wing of the Parliament Square development, to create an additional hotel floor and includes amendments to the roof structure. The maximum height of the extended building is 17.26m.

Figure 4: Showing the approved arrangement of the Murray Street Wing.

Figure 5: Showing the approved arrangement of the Murray Street Wing.

Figure 6: Showing the proposed arrangement of the Murray Street Wing.

Figure 7: Showing the proposed arrangement of the Murray Street Wing.

4. Background

4.1 The Parliament Square project was approved via the *Parliament Square Planning Act 2012* (the Parliament Square Act) as Permit Number PLN-10-00495-01. Section 6A of the Parliament Square Act allows the making of a new application to the Council for a use and development substantially related to the planning permit.

4.2 The residential hotel was originally approved by the Council in October 2015 under PLN-15-01151-01. Alterations to the hotel were approved under delegation in 2017 under PLN-17-271.

4.3 The extension and alterations proposed in this application originally formed part of a section 56 (minor amendment) application submitted to the Minister for Planning, pursuant to the Parliament Square Act. The Minister would not approve the extension and alterations as a section 56 minor amendment, and as a consequence they require separate planning approval. This application (PLN-18-798) seeks that separate planning approval for the extension and alterations. Various other changes to the proposal are being considered by the Minister as a section 56 application, including the removal of the 'capsule' shaped lift on the back of the hotel building on the corner of Davey and Murray Streets.

4.4 The intensification of the hotel use (i.e. the increase in the number of rooms) was approved by Council in July 2018 under delegation pursuant to section 58 of the *Land and Use Planning and Approvals Act 1993* under PLN-18-276. That application (PLN-18-276) was determined prior to the Minister refusing to approve the extension and alterations as a minor amendment.

5. Concerns raised by representors

5.1 No representations were received during the statutory advertising period between 16 and 30 November 2018.

6. Assessment

6.1 The *Sullivans Cove Planning Scheme 1997* is a performance based planning scheme. This approach recognises that there are in many cases a number of ways in which a proposal can satisfy desired environmental, social and economic standards. In some cases a proposal will be 'permitted' subject to specific 'deemed to comply' provisions being satisfied. Performance criteria are established to provide a means by which the objectives of the Planning Scheme may be satisfactorily met by a proposal. Where a proposal relies on performance criteria, the Council's ability to approve or refuse the proposal relates only to the performance criteria relied on.

6.2 The site is located in the Sullivans Cove Mixed Use Activity Area of the *Sullivans Cove Planning Scheme 1997*.

6.3 The existing approved use of the Murray Street wing is a residential hotel, which is a permitted use in the Activity Area. No change of use is proposed.

6.4 The proposal has been assessed against:

6.4.1 Parts A and B – Strategic Framework

6.4.2 Part D – Clause 2.0 – Activity Area Controls

6.4.3 Part E – Schedule 1 – Conservation of Cultural Heritage Values

6.4.4 Part E – Schedule 2 – Urban Form

6.4.5 Part E – Schedule 5 – Traffic, Access and Parking

6.5 The proposal relies on the following performance criteria to comply with the applicable standards:

6.5.1 Conservation of Cultural Heritage Values - clauses 22.4.5 and 22.5.5

6.5.2 Demolition - clause 28.3.1

6.6 Each performance criterion is assessed below.

6.7 Conservation of Cultural Heritage Values - Clause 22.4.5

6.7.1 The building at 12 Murray Street is heritage listed under the planning scheme. The proposal has been assessed by the Council's Senior Cultural Heritage Officer, who recommends the application be refused. The officer's assessment follows. Note the officer's full report is provided at Attachment C to this report.

Proposal

The proposal involves construction of an additional level (Level 03) behind the existing façade of the building known as 12 Murray Street. The additional level connects with Level 03 (Presidential Suite) of the previously approved new building which replaces the former 10 Murray Street State Office building. The new work will be set back approximately 2 metres from the building façade.

The existing building

The existing structure is the remnant two-storey, Inter-War Gothic Revival sandstone façade of a former office building. It is well-detailed and solidly constructed, featuring a parapet, pilasters which divide the façade into three bays, and a pediment surmounting the pronounced arched entrance.

12 Murray Street was constructed as the head office of the former Hydro-Electric Department (later Commission). The building was constructed in 1921 and 1922, with the offices first occupied in July 1922. The architectural design of the building has an interesting background. It was originally intended to locate this building in Davey Street, and its Tudoresque Gothic design bore a deliberate relationship with the two other government buildings in Davey Street – the former 1847-48 St Mary's Hospital / Lands and Survey Department offices (Alexander Dawson and William Porden Kay) and the 1884 Government Printing Office / Public Works Department building (William Waters Eldridge) – both representing similar architectural vocabulary. It was envisaged that the Hydro-Electric Department offices would complement the suite of Davey Street government buildings. Issues related to site and foundation conditions forced relocation of the Hydro-Electric Department offices to its Murray Street site. The Gothic design was retained – probably appearing somewhat 'old-fashioned' by 1922.

The Hydro-Electric Department building was constructed during an important phase in the expansion of electricity generation and distribution throughout Tasmania, and was the first time the department had its own building (it had previously leased office space). The rear of the building was utilitarian, in contrast to the relatively ornate façade.

The building is recognised as a Place of Cultural Significance in Table 1 of Schedule 1 of the *Sullivans Cove Planning Scheme 1997*. It is also on the Tasmanian Heritage Register.

The Planning Scheme

Schedule 1 of the *Sullivans Cove Planning Scheme 1997* includes the following submission requirements:

22.4.3 Submission Requirements

All applications for 'building or works' must satisfy the relevant submission requirements of clause 9.2 of the Scheme. In addition, pursuant to s.54 of the Land Use Planning and Approvals Act 1993, the following information may be required:

- *A Conservation Plan as defined in Clause 22.3.*
- *Street elevations or 'true perspectives' to show the scale and impact of 'building or works' on places of cultural significance.*

In this instance, a separate conservation plan was not requested or submitted, as one had been previously submitted (Parliament Square, Hobart – Conservation Management Plan, January 2009.)

The Conservation Plan recognises the significance of 12 Murray Street and its relationship with the two other Gothic-styled sandstone government buildings. It also notes its historical importance in terms of the Hydro-Electric Department (later Commission). The Conservation Plan states that the 'style, scale and materials [of 12 Murray Street] reflect a desire to create a harmonious governmental precinct.'

The Conservation Plan states that the façade must be retained with a high degree of external integrity and conservation. (7.3.2)

The exterior appearance of the site, which is a result of the existing form, external surfaces, materials and finishes of significant facades, should be preserved. … No new work should compromise the original significant facades. (7.4.1)

Where it is necessary to modify a façade, changes to the façade should reinforce the composition of the original façade. (7.4.2)

Despite the favourable assessment of the Heritage Impact Statement prepared by Design 5 – Architects Pty Ltd and submitted in support of the proposal, the proposal is not considered to be in compliance with the policies espoused in the Conservation Plan.

Relevant Scheme Provisions

22.4.5 'Discretionary' 'Building or Works'

'Building or works' on places of cultural significance which cannot satisfy the 'deemed to comply' provisions of Clause 22.4.4 may be approved at the discretion of the Planning Authority.

The following criteria must be taken into consideration in the assessment of all proposals to undertake 'building or works' on places of cultural significance:

- *'Building or works' must complement and contribute to the cultural significance, character and appearance of the place and its setting;*
- *'Building or works' must be in compliance with the conservation strategy of an approved Conservation Plan, where required and/or provided;*
- *The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any place of cultural significance;*
- *'Building or works' must not reduce the apparent authenticity of places of cultural significance by mimicking historic forms;*
- *'Building or works' may be recognisable as new but must not be individually prominent;*
- *The painting of previously unpainted surfaces is discouraged.*

Assessment

The proposed works do not complement and contribute to the cultural significance, character and appearance of the place. The proposed work is an incompatible contemporary addition, destroying the architectural expression of the existing building and its historical relationship with other former government buildings. The historic façade will appear nothing more than just a façade – a 'postage stamp' on the overall envelope of new development.

The proposal does not comply with the conservation strategy of the submitted Conservation Plan.

The location, bulk and appearance of the proposed work will adversely affect the heritage values of the existing façade, altering the relationship of the parapet with the space beyond, and providing an incongruent element which will inevitably be more closely associated visually with the adjacent new development, reducing the appearance of the façade to that of an ill-fitting mask.

The proposal fails to meet key conservation provisions, and warrants refusal.

Tasmanian Heritage Council

The Tasmanian Heritage Council has granted conditionally consent to the proposed works. The conditions relate to:

1. Archaeology.

2. Protection of façade.
3. Relationship of new floors to existing façade.
4. 2m setback and façade design issues.

Section 39 (9) of the *Historic Cultural Heritage Act 1995* sets out requirements of the planning authority if the Heritage Council consents to the discretionary permit being granted subject to the conditions specified in the notification (as in this case):

(9) If subsection (6)(b) applies and the relevant planning authority grants the discretionary permit –
(a) it must do so subject to (at least) the conditions required by the Heritage Council; and
(b) it must not make the discretionary permit subject to a condition that conflicts with any condition required by the Heritage Council.

Notwithstanding the consent of the THC, the planning authority is not bound to approve the proposed works. The planning authority may still refuse to grant the discretionary permit, and ultimately, this is considered to be the appropriate course.

Reasons for refusal

The proposal fails to comply with the requirements of clause 2.4.5 'Discretionary' 'Building or Works' of the Sullivans Cove Planning Scheme 1997 as:

1. It does not complement and contribute to the cultural significance, character and appearance of the place.
2. It does not comply with the conservation strategy of the submitted Conservation Plan.
3. The location, bulk and appearance of the proposed work will adversely affect the heritage values of the existing façade.

6.7.2 Based on the assessment of the Council's Senior Cultural Heritage Officer, the proposal does not comply with the performance criterion, and is recommended for refusal on that basis.

6.8 Demolition - Clause 28.3.1

6.8.1 The proposal requires minor demolition to facilitate the extension and alterations to the Murray Street wing.

6.8.2 Clause 28.3.1 of the planning scheme states that all demolition is discretionary.

6.8.3 Clause 28.6 sets out the matters to be considered in relation to any proposed demolition, as follows:

- *The impact of the proposed demolition on the character of the Activity Area;*
- *The impact of the proposed demolition on the cultural heritage values of the Cove; and*
- *The need to avoid creation of vacant sites and 'lost space' in the Cove.*

6.8.4 The proposed demolition is minor and will not have a deleterious impact on the character of the Activity Area, and will not create a vacant site or lost space in the Cove. The Council's Senior Cultural Heritage Officer has not raised any objection to the impact of the proposed demolition on the cultural heritage values of the Cove.

7. Discussion

7.1 Planning approval is sought for Partial Demolition, Alterations and Extension to Previously Approved Development, at 34 Davey Street, also known as Parliament Square.

7.2 The application was advertised and no representations were received.

7.3 The proposal has been assessed against the relevant provisions of the planning scheme and is considered to not perform well with respect to the Conservation of Cultural Heritage Values Schedule. The Council's Senior Cultural Heritage Officer has assessed the proposal and recommended refusal.

7.4 The Tasmanian Heritage Council has approved the application subject to conditions. The Notice of Heritage Decision is provided as part of the CPC Agenda Documents at Attachment B.

7.5 The proposal is recommended for refusal.

8. Conclusion

8.1 The proposed Partial Demolition, Alterations and Extension to Previously Approved Development at 34 Davey Street, Hobart does not satisfy the relevant provisions of the *Sullivans Cove Planning Scheme 1997*, and as such is recommended for refusal.

9. Recommendations

That: Pursuant to the *Sullivans Cove Planning Scheme 1997*, the Council refuse the application for Partial Demolition, Alterations and Extension to Previously Approved Development at 34 Davey Street, Hobart for the following reason:

1 The proposal does not meet the 'permitted' building or works' provision or the 'discretionary building or works provision at clauses 22.4.4 and 22.4.5 of the *Sullivans Cove Planning Scheme 1997* in relation to the listed place at 12 Murray Street because: (a) It does not complement and contribute to the cultural significance, character and appearance of the place; (b) It does not comply with the conservation strategy of the submitted Conservation Plan; and (c) The location, bulk and appearance of the proposed work will adversely affect the heritage values of the existing façade.

(Ben Ikin)
Senior Statutory Planner

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Rohan Probert)
Manager Development Appraisal

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 19 December 2018

Attachment(s):

Attachment B - CPC Agenda Documents

Attachment C - Planning Referral Officer Cultural Heritage Report

Tasmanian Heritage Council

Tasmanian Heritage Council
GPO Box 618 Hobart Tasmania 7000
Level 3, 200 Collins St, Hobart Tasmania 7000
Tel: 1300 850 332
enquiries@heritage.tas.gov.au
www.heritage.tas.gov.au

PLANNING REF:	PLN-18-798
THC WORKS REF:	5766
REGISTERED PLACE NO:	2287, 7149, 2286 and 2544
FILE NO:	15-18-46THC
APPLICANT:	Citta
DATE:	11 December 2018

NOTICE OF HERITAGE DECISION

(*Historic Cultural Heritage Act 1995*)

The Place:	Parliament Square, 34 Davey Street, Hobart.
The Registered Places:	Former St Mary's Hospital, 36 Davey Street, Hobart. Former Government Printing Office, 34 (West) Davey Street, Hobart. Dept. of Health and Community Services Offices, 34 Davey Street, Hobart. Former HEC Office, 12 Murray Street, Hobart.
Proposed Works:	Partial demolition, alterations and extension to previously approved development.

Under section 39(6)(b) of the *Historic Cultural Heritage Act 1995*, the Heritage Council gives notice that it consents to the discretionary permit being granted in accordance with the documentation submitted with Development Application PLN-18-798, advertised on 16/11/2018, subject to the following conditions:

1. **An archaeological method statement (AMS) is to be prepared for the recovery of any artefacts and recording of features of archaeological significance that may be uncovered on the site of 12 Murray Street in the course of its excavation. The AMS must be consistent with the approach outlined in the Tasmanian Heritage Council's Practice Note No 2 (version 4, November 2014) *MANAGING HISTORICAL ARCHAEOLOGICAL SIGNIFICANCE IN THE WORKS PROCESS*. This AMS must be submitted to and endorsed by Heritage Tasmania's Works Manager prior to the commencement of excavation work at 12 Murray Street. The AMS must cover the extent of the building footprint of the building that most recently occupied 12 Murray Street.**

   (ii) Archaeological recovery and recording work must be carried out in accordance with the endorsed AMS.

Reason for condition
To ensure that the archaeological values of the registered place are appropriately managed.

2. **The façade of 12 Murray Street is to be securely retained and protected from damage during demolition works; and, any damage to the façade shall be made good using construction methods and materials that Heritage Tasmania's Works Manager is satisfied are appropriate for the conservation of the façade's heritage values, prior to occupation of the rebuilt building on this part of the site.**

Reason for condition
To ensure that this significant façade is protected and retained.

3. **Any concrete floors in the new structure at 12 Murray Street must be detailed such that the junctions between the slab and existing masonry walls are constructed:**
   - **(a) To not result in the transfer of moisture or the introduction of soluble salts from new concrete into the stonework of the heritage façade of 12 Murray Street; and,**
   - **(b) To enable the evaporation of moisture from the ground at the base of the heritage façade of 12 Murray Street.**

   A dimensioned and notated sectional drawing that meets the above requirements must be submitted to Heritage Tasmania and be to the Works Manager's satisfaction before construction of new floors commence.

Reason for condition
To avoid any circumstances that may cause or exacerbate rising damp in the masonry of the heritage façade at 12 Murray Street.

4. **The new Level 2 and 3 extension to 12 Murray Street must be designed such that:**
   - **(a) The new work is set back a minimum of 2 metres from the face of the sandstone façade of 12 Murray Street; and,**
   - **(b) The roof and wall design must present a minimal profile (i.e. devoid of eye-catching detail); and,**
   - **(c) The wall cladding must be of a transparent material or materials that have a visually recessive colour when viewed against the backdrop of an ordinary daytime sky.**

   A dimensioned and notated sectional drawing that meets the above requirements must be submitted to Heritage Tasmania and must be to the Works Manager's satisfaction before construction work to this part of the building commences.

Reason for condition
To ensure that the new upper level extension does not create undue visual distraction from the façade of 12 Murray Street and thereby diminish the heritage value of this facade.

Advice
It is recommended that the applicant contacts Heritage Tasmania as soon as possible to discuss the requirements of Condition 1 of this Notice, and the requirements of the Heritage Council's consent for Works Application 5292 (PLN-12-271).

Please ensure the details of this notice, including the conditions and advice, are included in any permit issued, and forward a copy of the permit or decision of refusal to the Heritage Council for our records.

Please contact Deirdre Macdonald on 6165 3712 if you require clarification of any matters contained in this notice.

Pete Smith
Director – Heritage Tasmania
Under delegation of the Tasmanian Heritage Council

PLN-18-798 - 34 DAVEY STREET

Application Information

Application Details

PLN-18-798 Partial Demolition, Alterations and Extension to Previously Approved Development
Submitted on: 06/11/2018
Accepted as Valid on: 06/11/2018
Target Time Frame: 42 Days.
Elapsed Time: 7 Days Expiry date: 18/12/2018
Officer: Ben Ikin

Have you obtained pre application advice?

Yes

If YES please provide the pre application advice number eg PAE-17-xx

Refer Ben Ikin - Senior Statutory Planner HCC

Are you applying for permitted visitor accommodation as defined by the State Government Visitor Accommodation Standards? Click on help information button for definition. If you are not the owner of the property you MUST include signed confirmation from the owner that they are aware of this application. *

No

Is the application for SIGNAGE ONLY? If yes, please enter $0 in the cost of development, and you must enter the number of signs under Other Details below. *

No

If this application is related to an enforcement action please enter Enforcement Number

Details

What is the current approved use of the land / building(s)? *

Hotel

Please provide a full description of the proposed use or development (i.e. demolition and new dwelling, swimming pool and garage) *

Hotel

Estimated cost of development *

0.00

Existing floor area (m2)	Proposed floor area (m2)	Site area (m2)

Carparking on Site

Total parking spaces	Existing parking spaces	N/A
0	0	Other (no selection chosen)

Other Details

Does the application include signage? *

No

How many signs, please enter 0 if there are none involved in this application? *

0

Tasmania Heritage Register

Is this property on the Tasmanian Heritage Register?

Yes

Edit

Citta Hobart Pty Ltd
ACN 142 079 936

Suite 2, Level 23
6 O'Connell Street
Sydney NSW 2000

T +61 2 9259 5888
F +61 2 9247 2266
parliamentsquare.com.au

citta

PARLIAMENT SQUARE —

Date

05/11/2018

Hobart City Council
16 Elizabeth Street
Hobart
TAS 7000

Attention: Mr Ben Ikin

Letter Ref: HCC18005

Dear Sir,

Parliament Square Redevelopment Project
Planning Permit Application – Alterations to Approved Development – Murray Street

Please find attached our application for a planning permit for alterations to the Parliament Square development. In support of this application please find attached the following documents:

1. Planning Assessment Report by AllUrban Planning dated 31 October 2018
2. Drawings by FJMT architects:
   - DA-CH-1202 Murray Street and Backdrop to Parliament House
   - DA-CH-1302 East/West and North Sections
   - DA-CH-2013 Visibility over Parliament House – 3D Perspectives
   - DA-CH-1108 Level 3
   - DA-CH-1109 Level 4
3. Heritage Impact Statement by Design 5 Architects dated 02 May 2018 (refer relevant section as highlighted).

Should you have any further queries or require any further information regarding this matter, please contact the undersigned.

Yours sincerely,

Shaun Wilson
Project Director
Citta Hobart Pty Ltd
As Principal's Project Manager for
PARLIAMENT SQUARE HOBART LANDOWNER PTY LTD
(in its personal capacity and its capacity as trustee of Parliament Square Landowner Trust)

cc Allan Wood – Department of Treasury and Finance

Enc.

— URBAN COMMONS

AllUrbanPlanning PTY LTD

31 October 2018

Jennifer Cooper
Citta Hobart Pty Ltd
49A Davey Street
HOBART Tas 7000

Dear Jennifer,

Parliament Square
New application for a planning permit - Alterations to approved development – Murray Street wing

All Urban Planning Pty Ltd has been engaged by Citta Property Group Pty Ltd to prepare a planning assessment for a new application for a planning permit for alterations to the Parliament Square development under planning permit PLN-17-271. The proposal is for alterations and extensions to the Murray Street wing to add an additional hotel floor and amendments to the roof structure as shown on the following plans:

- DA-CH-1202 Murray Street & Backdrop to Parliament House
- DA-CH-1302 East/West & North Sections
- DA-CH-2013 Visibility Over Parliament House - 3D perspectives
- DA-CH-1108 Level 3 Plan
- DA-CH-1109 Level 4 Plan

The proposal follows Further Permit PLN-18-276 for Alterations to and intensification of use for previously approved development issued by Hobart City 18 July 2018. This permit increased the number of hotel rooms in 34 Davey Street and 12 Murray Street by 24 to a total of 152 rooms. This proposal does not alter the number of hotel rooms approved under that permit.

No changes are proposed to car parking or vehicle access to the site.

Background

The Parliament Square project was approved via the Parliament Square Planning Act (Parliament Square Act) as Permit Number PLN10-00495-01 (the planning permit).

Section 6A of the Parliament Square Act 2012 allows the making of a new application to Hobart City Council for a use and development substantially related to the planning permit.

Planning Assessment

A residential hotel is a permitted use on Murray Street under the Use table 16.3.1 of the planning scheme.

12 Murray Street is heritage listed under the planning scheme and Tasmanian Heritage Register.

AllUrbanPlanning PTY LTD

The proposed upper level extension on the Murray Street frontage would remain below the permitted height of 18m (a maximum height of 17.26m is proposed setback and 17.01m at highest point on the street front as shown on DA-CH-1202) and complies with Clause 23.6.1A of the planning scheme.

The extension to the upper level of the building is subject to discretionary consideration under Clause 22.4.5 of Schedule 1 – Conservation of Cultural Heritage Values of the planning scheme including evaluation of the following:

- *'Building or works' must complement and contribute to the cultural significance, character and appearance of the place and its setting;*
- *'Building or works' must be in compliance with the conservation strategy of an approved Conservation Plan, where required and/or provided;*
- *The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any place of cultural significance;*
- *'Building or works' must not reduce the apparent authenticity of places of cultural significance by mimicking historic forms;*
- *'Building or works' may be recognisable as new but must not be individually prominent;*

Assessment

The HIA confirms that the design of the upper level is not individually prominent and complements and contributes to the cultural heritage significance of 12 Murray Street. It therefore satisfies Clause 22.4.5.

I would be pleased to explain or discuss further as necessary

Regards

Frazer Read
Principal
AllUrbanPlanning PTY LTD
m 0400109582
e frazer@allurbanplanning.com.au

DESIGN 5

A R C H I T E C T S

PARLIAMENT SQUARE, HOBART
Proposed Alterations to Approved Development

HERITAGE IMPACT STATEMENT
Combined Hotel Development Application
2 May 2018

1. BACKGROUND

Design 5 – Architects have been involved with the scheme proposed by Citta Property Group from the initial tender stage to the present. As heritage architect in the project team, we have been working collaboratively with the project architects Francis-Jones Morehen Thorp (fjmt) throughout the design development, documentation, and now construction process. We have prepared the Heritage Impact assessments for all previous applications regarding this project.

This present proposal has been developed in collaboration with Design 5 – Architects.

1.1 Summary of amendments and additions proposed to approved development

This proposal to alter and add to the original development, as amended by subsequent approvals, is a result of ongoing refinements to the combined hotel proposal. It comprises proposed modifications to the new and existing building elements, and new additions. Those changes that have potential heritage impacts include the following:

12 Murray Street:

- Additional floor accommodating hotel rooms, and amendments to the roof structure
- Change of use to re-assembled Blackwood Rooms from hotel suite to meeting rooms

34 Davey Street:

- Deletion of external glass lift, and reconfiguration of internal passenger and goods lift arrangements and back-of-house stair

36 Davey Street:

- New opening in Salamanca Place façade

Red Brick Building:

- Modifications to roof form over bar/dining area

1.2 Documents referenced

The proposed Alterations to the Approved Development considered in this report are described in documents prepared by FJMT, specifically the drawings numbered:

5-13 Queen Street, Chippendale NSW 2008
Tel (02) 9319 1855 (02) 9319 0836 Fax
E-mail: design5@design5.com.au
Design 5 – Architects Pty Ltd ABN 22 090 066 194
Nominated Architect – Alan Croker, Registration No 4693
Matthew Byrnes 8918 Robert Gasparini 7614 Lian Wong 8532 Anita Krivickas 8253

0 REFERENCE

DA-CH-0001	Cover Sheet
DA-CH-0002	Site Plan
DA-CH-0003	Public Domain Plan

1 GENERAL SITE

DA-CH-1001 - DA-CH-1013	Amendments & Additions Key Plans
DA-CH-1101 - DA-CH-1113	General Arrangement Plans
DA-CH-1201 - DA-CH-1202	Site Elevations
DA-CH-1301 - DA-CH-1303	Site Sections

2 SITE & LANDSCAPE

DA-CH-2011 - DA-CH-2013	Detail Studies – Visibility Over Parliament House / Visual Impact Analysis
DA-CH-2101 - DA-CH-2102	Landscape / Site – Landscape / Accessibility Plans

1.3 Report structure

The report is set out in the following manner:

Part 1. Introduction
Part 2. Cultural significance – summary
Part 3. Summary description of proposed amendments and discussion of impacts
Part 4. Summary conclusion of the heritage impact of the proposal

1.4 Author identification

This report was prepared by Lian Wong and Alan Croker (Director) of Design 5 - Architects.

2. CULTURAL SIGNIFICANCE - SUMMARY

All of the existing buildings affected by this proposal are listed on the Tasmanian Heritage Register.

The following summary statement of significance for the site is taken from the Parliament Square Conservation Management Plan (CMP) prepared by Architectural Projects, dated January 2009.

The site and collection of buildings that comprise parliament square has high historical significance for its ability to provide evidence of the early development patterns of Hobart and for its association with Parliament House and the development of Sullivans Cove as the place from which Australia's second oldest State capital city grew. The site has historical significance because of the ongoing continuity of use by Government Departments in occupying the site.

Parliament square has creative significance as a prominent collection of buildings that provide a backdrop to the setting of Parliament House and Gardens. The site is also significant as a collection of buildings that exemplify fine examples of varied taste, date, style or technology.

The site of parliament square has significance for its potential to yield new or further archaeological information including outbuildings, remnants of the 1900s toilet block along Salamanca Place, internal floor cavities of the former St Mary's Hospital and extensions to house various Government Offices. Parliament square has historical significance as a complete street block that has consolidated over time into long-term Government ownership over a period of 150 years. The site has social significance for its associations with the Tasmanian Government and is also considered significant as an integral part of the wider historic Sullivans Cove, that is still largely intact and is used daily by the people of Hobart for commercial, cultural and recreational purposes.

Parliament square has historical associative significance because of its association with Parliament House that has high heritage value for its association with groups and individuals of the highest significance in the history of Tasmania, including all Tasmanian members of Parliament since the 1840s.

Parliament square and Parliament House are also significant for their association with prominent architects John Lee Archer, William Porden Kay, SWT Blythe and Hartley Wilson and Bolt.

3. SUMMARY DESCRIPTION OF PROPOSED AMENDMENTS AND DISCUSSION OF IMPACTS

The heritage impacts on each of the proposed amendments are discussed below.

3.1 12 Murray Street

Additional floor accommodating hotel rooms, and amendments to the roof structure

An additional floor is proposed to 12 Murray Street, extending the full width of the building.

In order to minimise the overall height of the new building, several strategies were employed. Whilst the Level 1 finished floor level (FFL) is proposed to be the same as the currently approved scheme, the new Level 2 FFL will be lowered. The approach for accommodating services to the hotel rooms has been modified to minimise the depth of the floor plates, ensuring the windows of the stone façade are not concealed as a result of the lowered FFL.

The façade of the new second and third floors are glazed and of a simple minimal design, so it forms a visually recessive backdrop behind the sandstone façade. The roof form has been simplified so the overall building height is minimised. A small section is raised above the main roof line to accommodate services only where required, and set back so it is not visible from the street. We note the proposed design of the front edge of the roof is in accordance with Condition 8 of the Tasmanian Heritage Council Notice of Heritage Decision for Planning Permit PLN-17-271.

The section of new building to the east of the stone façade is proposed to be increased to 3 storeys above street level and a rooftop terrace. Although the parapet height of this section is now higher than the stone façade adjacent, the design of the new façade has been modified to lessen the visual impact. A slightly recessed section directly adjacent to the stone façade helps the bulk of the new façade read as a separate element, so the stone façade is not visually dominated. Furthermore, the design of this new facade matches that of the new floors above 34 Davey Street, helping unify the components across the site.

The internal re-planning of hotel rooms is associated with the additional floor is considered to have a neutral impact.

As with the approved design, the new proposal constitutes a clear and modern addition to the retained building, floating free of the façade and respecting its architecture, symmetry and prominence. Although higher than the currently approved design, it is our opinion that the strategies employed to keep the additional height to a minimum are successful in minimising the impact on the heritage significance of this façade, and this proposed design is supported.

Change of use to re-assembled Blackwood Rooms from hotel suite to meeting rooms

As a result of internal re-planning associated with the proposed additional floor, an opportunity arose to use the Blackwood Rooms as meeting rooms rather than hotel rooms as per the approved design.

This is considered a highly positive change, as the proposed use is now aligned with the original use of these rooms, allowing the significant joinery to be appreciated in the context for which they were designed, and by a broader audience. Another benefit is that fewer modifications to the joinery will be required to accommodate services for meeting rooms rather than hotel rooms. The proposed change of use is supported.

3.2 34 Davey Street

Deletion of external glass lift, and reconfiguration of internal passenger and goods lift arrangements and back-of-house stair

The current approved scheme includes a new goods lift at the southern end of 34 Davey Street and a new external glass lift on the eastern (plaza) side of 34 Davey Street. In this proposed amendment, the glass lift is deleted and replaced with two new passenger lifts in a new lift shaft to the north of the Davey Street entry. The existing lift shaft at the centre of the southern stairwell (with a new lift car) is reused for the goods lift.

The existing lift shaft is too small to accommodate a dedicated goods lift, so it was to be used as a services riser in the approved scheme, however an operational decision was made to accept a slightly smaller new lift car in the proposed scheme. This is considered a positive change, as it retains the integrity of the originally designed stairwell and lift shaft.

The new internal lift shaft is proposed to be offset from the inside face of the western façade, to accommodate window dressing and backlighting to enable this bank of windows to remain visually 'active' from the outside. We believe the change to the façade will be of negligible impact. Some internal re-planning of hotel rooms is required as a result of the reconfiguration of the lifts, which will have a neutral impact.

In the current approval, the new back-of-house stair from Lower Ground to Ground Floor is incorporated into the existing southern lift shaft and stairwell. Recent test pits have revealed a large concrete beam at the base of this existing structure. The structural engineers have advised that accommodating a new stair in this area would be complex and costly, as well as creating the risk of potential disturbance to the existing stairwell and glass block façade. In this proposed amendment, the back-of-house stair is relocated to the eastern (plaza) side of the main facade. This will project forward of the façade, but is confined to one level only, remaining below the new awning. It is therefore considered to be of minimal visual impact, and outweighed by the benefit of mitigating risk of disturbance the glass block façade.

Although the eastern façade of 34 Davey is not highly significant, the deletion of the external glass lift allows the façade to be viewed more clearly and with fewer obstructions. In lieu of new full size openings connecting each floor with the external glass lift, modified window openings are proposed. These are consistent in size with the existing windows to the north, and we recommend a design of a slightly different configuration in order to reference the existing (smaller) openings. The impact of this change can be considered positive, and the overall changes to the lifts and stair are supported.

3.3 36 Davey Street

New opening in Salamanca Place facade

In this proposal, a new opening is proposed to the Ground Floor of the Salamanca Extension, to provide direct access between the Whisky Bar and the external passageway adjacent to Salamanca Place. This is in a different location to the new opening originally proposed and approved (and subsequently deleted in the currently approved scheme), and is narrower, however it follows the same principles. The new opening is centred below the windows above, respecting the order and regularity of the architecture. It is proposed to be within a new steel portal frame, allowing it to be read as a clearly new insertion, consistent with others across the site. Furthermore, this new opening is opposite the existing gate to Salamanca Place, so a new opening in the stone fence is no longer required.

The new opening will help provide a more direct connection between Salamanca Place and the public use of the internal space within the building, helping enliven the streetscape. Although the new opening will have high impact on the significant fabric of the place, this impact is considered to be outweighed by the benefit to the streetscape and longer term viability of the proposed use, and is therefore supported.

3.4 Red Brick Building

Modifications to roof form over bar/dining area

The design of the roof over the bar/dining area is proposed to be modified following a review of thermal comfort and Environmentally Sustainable Design requirements, as well as refinements to the kitchen exhaust system. The proposed design retains the green roof and edge detail the approved design, but part of the glazed roof is replaced with a solid roof. Skylights are incorporated into this section of the roof within truncated pyramids, which are echoed by the form of the kitchen exhaust within the green roof.

As discussed in the previous Heritage Impact Statement, the stone facades of 34 West and 36 Davey Street are of high significance, and the Red Brick Building is of low significance, with parts of it deemed intrusive. While it is important to retain evidence of the evolution of the buildings and site, it is also important to acknowledge the hierarchy of heritage significance. That is, the detailing of the new and modified elements of the Red Brick Building should not obstruct, but rather help facilitate this connection with the stone buildings behind it.

We note the roof over the bar/dining area retains a glazed perimeter, helping articulate the separation between the Red Brick Building and stone buildings adjacent, while also meeting thermal comfort and ESD requirements. The principle of the design is largely the same as the approved design, and is considered to be of neutral impact so the proposed change is supported. However, further detailed resolution of the fenestration and roof edge is required, to maximize the feelings of 'openness' and 'lightness' of the Red Brick Building, ensuring the stone buildings are legible from the plaza when viewed aerially from the Salamanca tower.

4. SUMMARY CONCLUSION

The design development of the combined hotel scheme has some additional impacts to the heritage significance of the place, but most are of negligible or neutral impact, and overall, the proposed changes are considered acceptable.

The additional floor to 12 Murray Street is the most significant change to the scheme, but we consider the proposed elevation to have been thoughtfully designed in terms of respecting the heritage significance of the original stone façade. In our opinion, the impact of the additional floor has been minimised such that we can support the proposed design. The change of use of the Blackwood Rooms from hotel rooms to meeting rooms is highly positive.

The deletion of the external glass lift from 34 Davey Street and reconfiguration of internal lifts is of neutral to positive impact. The amended back-of-house stair is of minimal impact, but considered to be outweighed by the benefit of mitigating risk of disturbance to the existing glass block façade.

The new opening in the Salamanca Place façade will have a high impact on the significant fabric of the place, but is considered to be outweighed by benefits to the streetscape and precinct.

The modifications to the Red Brick Building roof are of neutral impact.

Overall, the proposal to alter the existing development approval is supported, but it is essential that the recommendations made in this Heritage Impact Statement are implemented to minimise any adverse impacts.

Lian Wong
Design 5 – Architects Pty Ltd
2 May 2018

Existing Finishes, Retained

ST SANDSTONE
PM1 RENDERED, PAINTED MASONRY / CONCRETE FACADE
PM2 RENDERED, PAINTED MASONRY WITH ASHLAR RELIEF
GR GALVANISED ROOF SHEETING
RB RED BRICK FACADE

New Proposed Finishes

GL1 SINGLE SKIN GLAZED HOTEL FACADE, FRITTED GLASS
GL2 CLEAR GLAZED LIFT / STAIR FACADE, METAL FIXINGS
GL3 CLEAR GLAZED HOTEL SUITE / RETAIL FACADE
GL4 CLEAR GLAZED HOTEL SUITE FACADE, METAL PRIVACY SCREEN
~~GL5 CLEAR GLAZED HOTEL SUITE FACADE, TIMBER PRIVACY SCREEN~~
GL6 CLEAR GLAZED OFFICE FACADE WITH SUNSHADE LOUVERS
~~GL7 CLEAR GLASS AWNING~~
GL8 CLEAR GLAZED RETAIL FACADE WITH SANDSTONE SCREEN

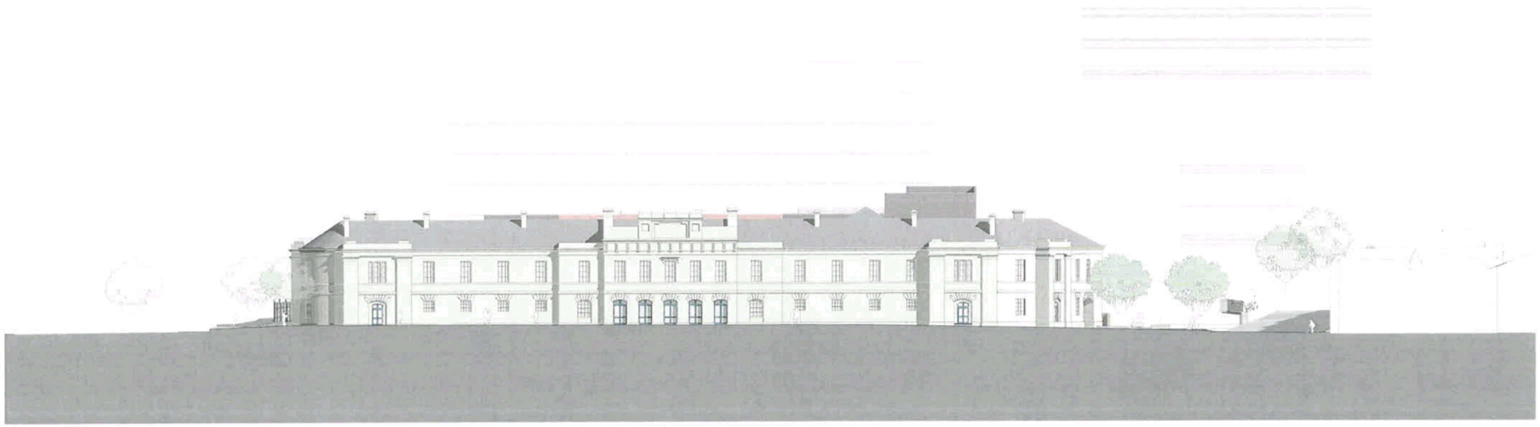
TC TERRACOTTA SOLID FACADE PANELS

MR METAL ROOFING AND ROOF PLANT LOUVRES SCREEN
RS METAL ROLLER SHUTTER TO CARPARK ENTRY RAMP
MFR METAL FEATURE ROOF / AWNING
MC METAL COMPOSITE SOLID PANEL

~~TFR TIMBER LINED FEATURE ROOF / AWNING~~
FRA FEATURE ROOF / AWNING
LGR OFF-FORM CONCRETE AND LANDSCAPE GREEN ROOF OVER RED BRICK BLDG

~~OFC OFF-FORM CONCRETE ROOF POD OVER RED BRICK BLDG~~

2 ELEVATION Murray Street Site Elevation
1:200



1 ELEVATION Backdrop to Parliament House Elevation
1:200

fjmt

Murray Street and Backdrop to Parliament House
Citta Property Group - Parliament Square Hobart

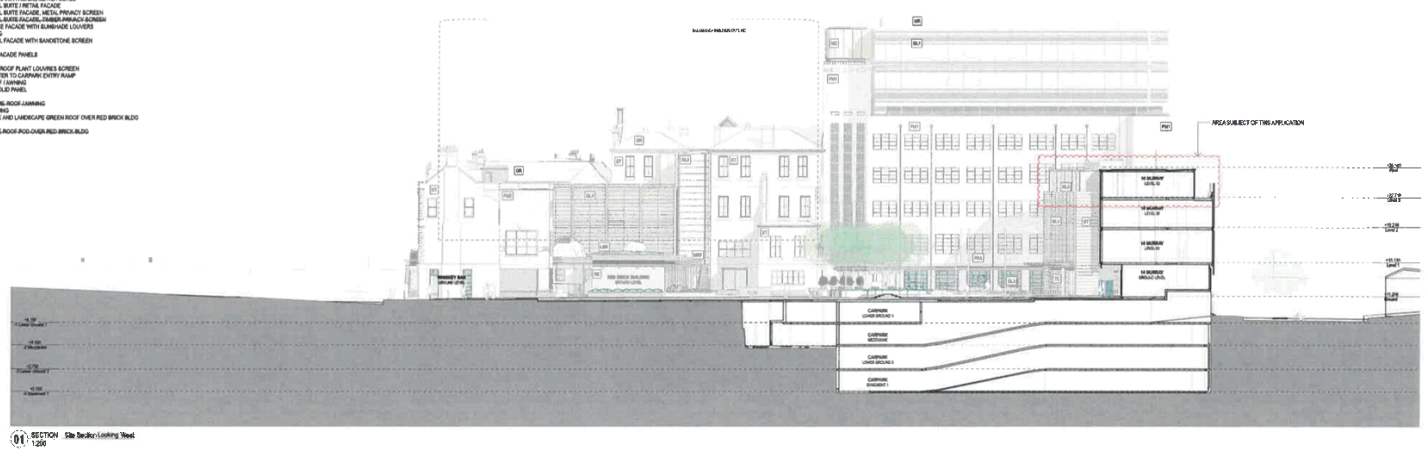
1:200 @ B1
COMBINED HOTEL DEVELOPMENT APPLICATION
DA-CH-1202

Existing Finishes, Retained

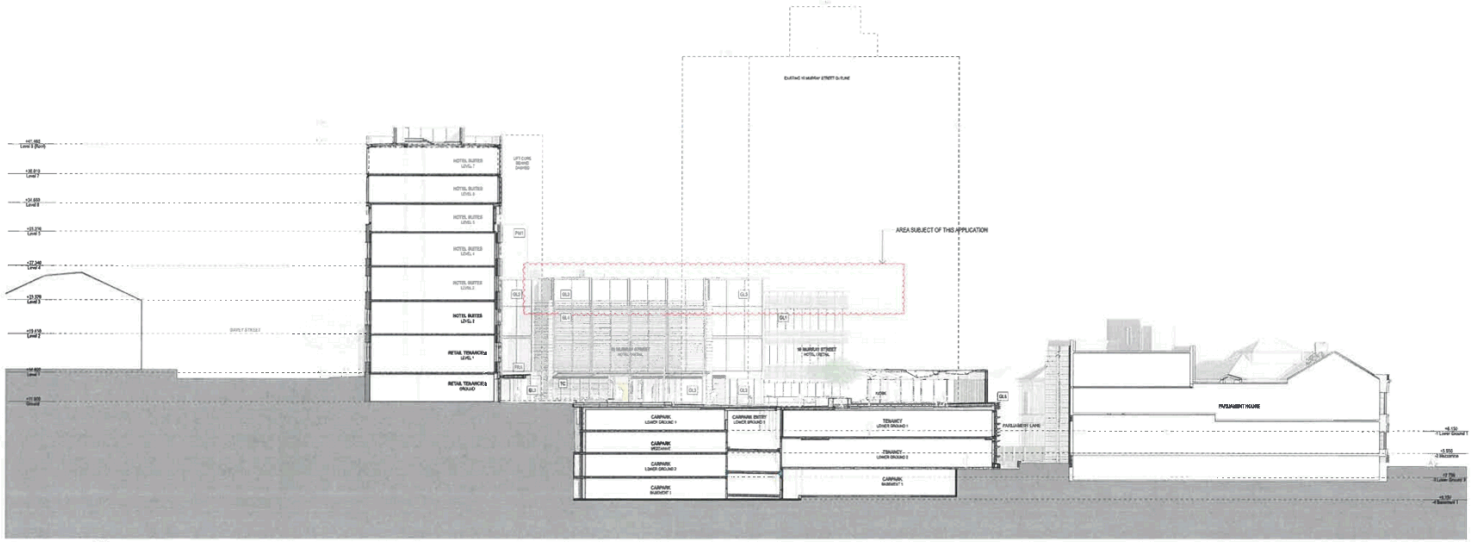
ST	SANDSTONE
PM1	RENDERED, PAINTED MASONRY / CONCRETE FACADE
PM2	RENDERED, PAINTED MASONRY WITH ASHLAR RELIEF
GR	GALVANISED ROOF SHEETING
RB	RED BRICK FACADE

New Proposed Finishes

GL1	SINGLE SKIN GLAZED HOTEL FACADE, FRITTED GLASS
GL2	CLEAR GLAZED LIFT / STAIR FACADE, METAL FISHES
GL3	CLEAR GLAZED HOTEL BUTT / RETAIL FACADE
GL4	CLEAR GLAZED HOTEL BUTT FACADE, METAL PRIVACY SCREEN
GL5	CLEAR GLAZED HOTEL BUTT FACADE, TIMBER PRIVACY SCREEN
GL6	CLEAR GLAZED OFFICE FACADE WITH SUNSHADE LOUVERS
GL7	CLEAR GLASS AWNING
GL8	CLEAR GLAZED RETAIL FACADE WITH SANDSTONE SCREEN
TC	TERRACOTTA SOLID FACADE PANELS
MR	METAL ROOFING AND ROOF PLANT LOUVRES SCREEN
RS	METAL ROLLER SHUTTER TO CARPARK ENTRY RAMP
MFR	METAL FEATURE ROOF / AWNING
MC	METAL COMPOSITE SOLID PANEL
TAA	TIMBER LINED FEATURE ROOF AWNING
FRA	FEATURE ROOF / AWNING
LGR	OFF-FORM CONCRETE AND LANDSCAPE GREEN ROOF OVER RED BRICK BLDG
~~OFC~~	~~OFF-FORM CONCRETE ROOF POD OVER RED BRICK BLDG~~



01 SECTION Site Section Looking West
1:200



02 SECTION Site Section Looking North
1:200

East/West & North
Site Property Group - Parliament Square Hobart

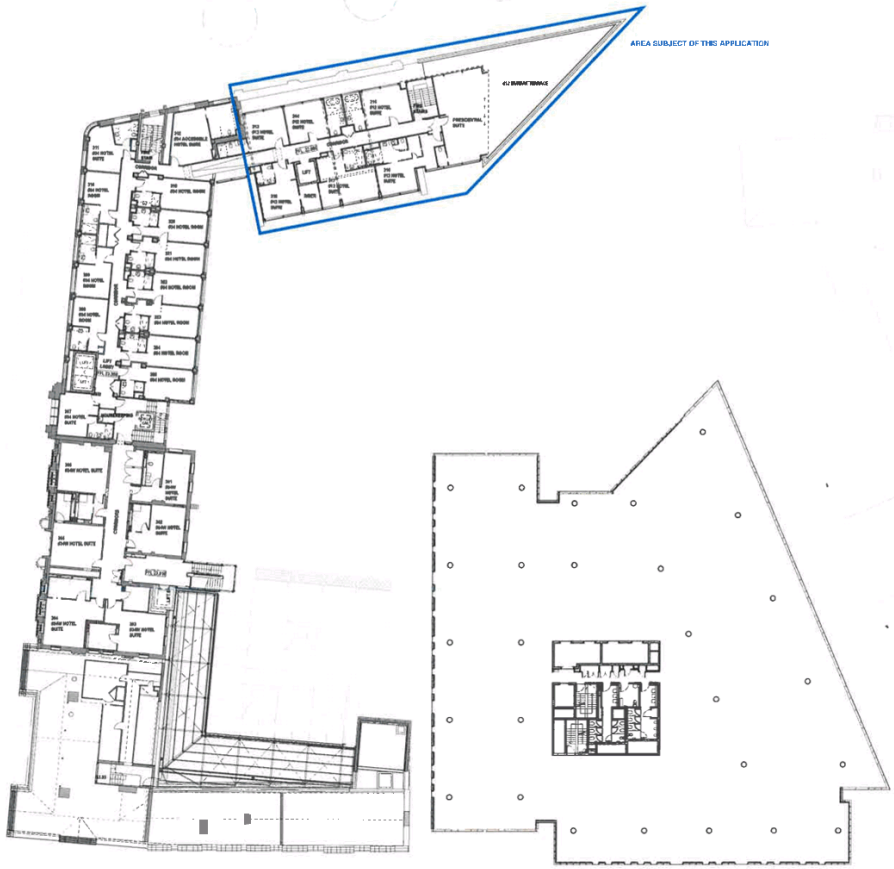
1:200 @ B1
COMBINED HOTEL DEVELOPMENT APPLICATION

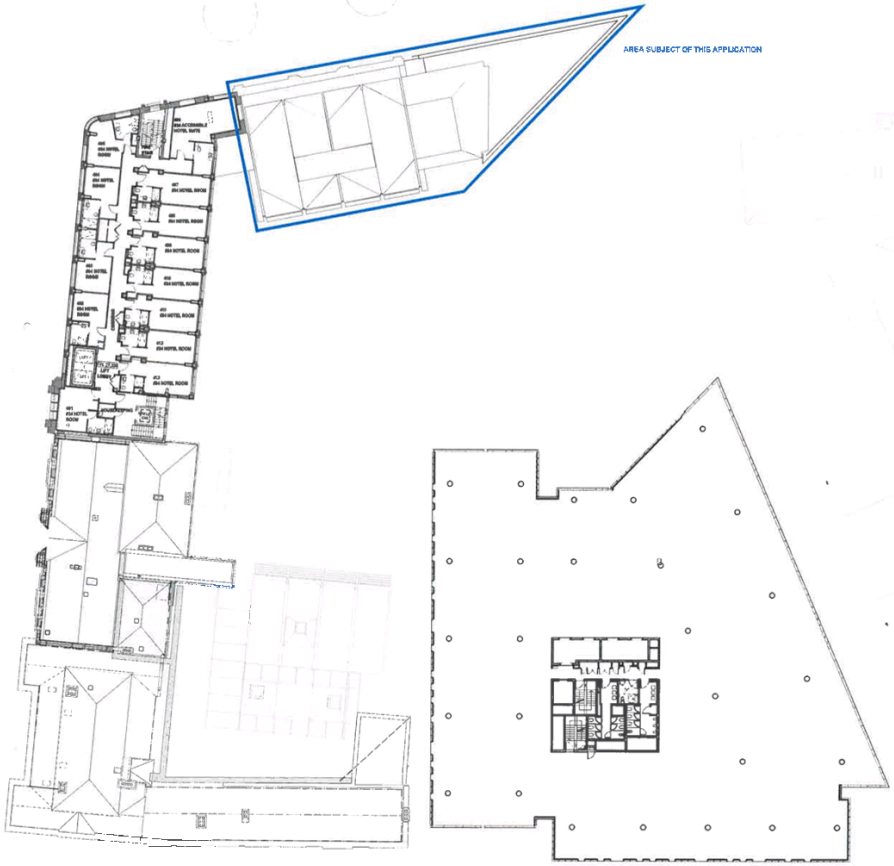
31/10/2018
DA-CH-1302

01 3D VIEW Perspective - Visibility of Mech. Plant

03 3D VIEW Perspective - Visibility of Mech. Plant

02 3D VIEW Perspective - Visibility of Mech. Plant


AREA SUBJECT OF THIS APPLICATION



Level 4
Cita Property Group - Parliament Square Hobart

1:200 @ B1
26 April 2018
COMMERCIAL HOTEL DEVELOPMENT APPLICATION
DA-CH-1109

SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY NOTES SHEET 1 OF 7 SHEETS	Registered Number P156768	SURVEY CERTIFICATE
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY	DESCRIBE BY REPORT THE EVIDENCE USED TO DETERMINE BOUNDARIES	

I, Craig McDowall Terry of Hobart in Tasmania a Registered Land Surveyor HEREBY CERTIFY that:
(a) this survey is based upon the best evidence that the nature of the case admits
(b) the survey notes have been truly compiled from surveys made by me or made under my supervision; and
(c) this survey and accompanying survey notes comply with relevent legislation affecting surveys and are correct for the purpose required.

Signature Date 10 / 5 / 2010

Surveyors Reference: L752C

Survey Notes
by Surveyor C. M. Terry

CITY OF HOBART

Section 27A Survey
The Crown - Owner
(See Lands Office plan CRP8497)

Survey Commenced: 17 / 2 / 09
Survey Completed: 6 / 4 / 09
Error of Close: - See Calcs

Notes and Report:

- Bearing datum is GDA 94, per connection between SPMs 8966, SPM 8978.
- Horizontal coordinate datum is MGA per SPM 8966.
- Adopted sea level correction of 1.0000 and scale factor of 0.99961. This results in a combined factor of 0.99961
- Corners have been adopted per occupation where not defined previously.
- Method of survey - Conventional traverse.
- All boundaries are open unless otherwise stated

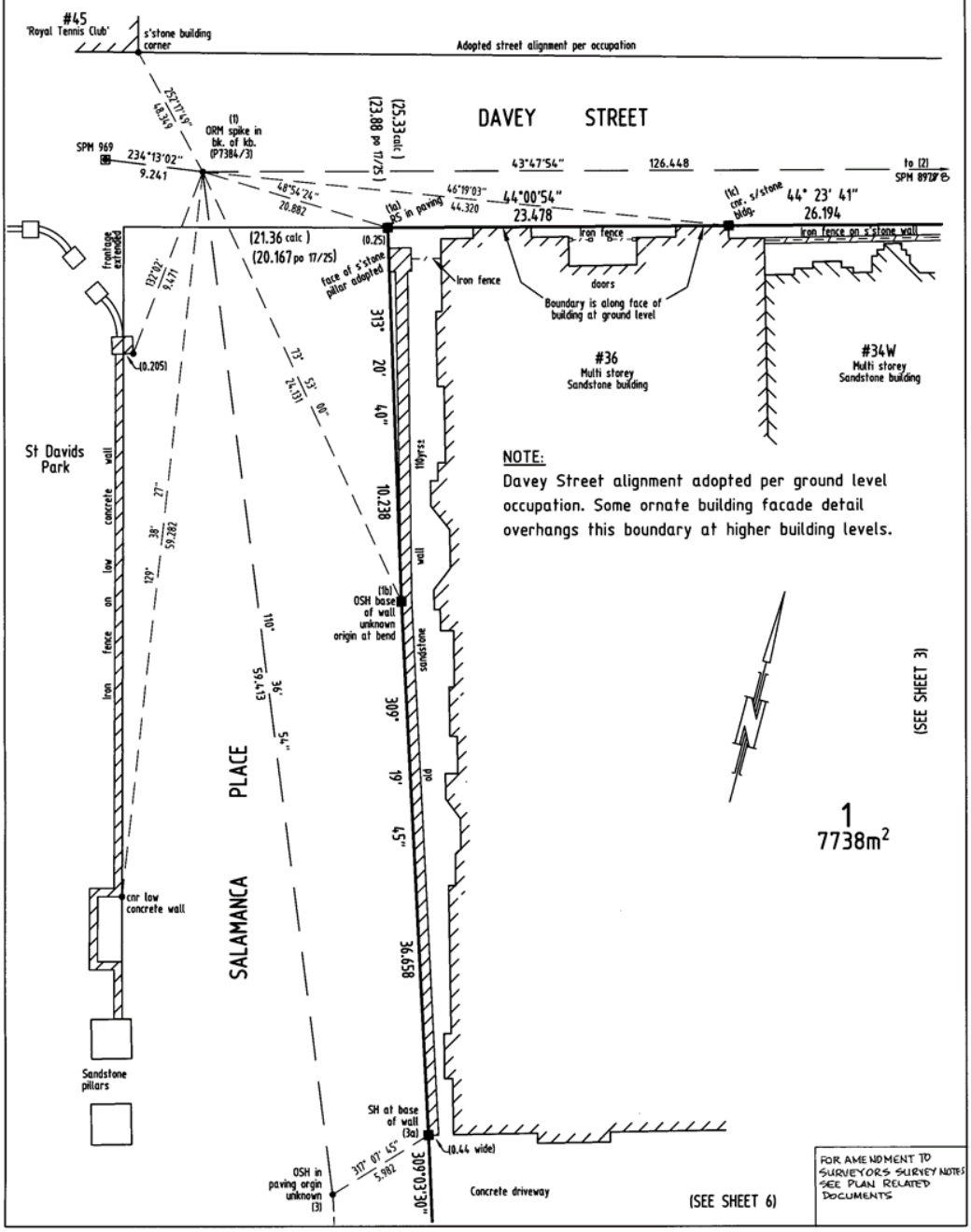
MGA 94 Coordinates				
Stn/Point	E	N	Origin	Estimated Positional Uncertainty
SPM8966	526 998.100	5 251 738.410	Surcom	Second order
SPM8978	526 936.094	5 251 960.144	Surcom	Second order
RS in paving (1a)	526 864.342	5 251 882.633	Calc	0.04 ±
SH in path (2a)	526 924.255	5 251 944.115	Calc	0.04 ±
SH base of wall (10a)	526 987.733	5 251 909.810	Calc	0.04 ±
Slate BLD CNR (5m)	526 946.607	5 251 814.915	Calc	0.04 ±

SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY NOTES ANNEXURE SHEET SHEET 2 OF 7 SHEETS	OWNER THE CROWN FOLIO REFERENCE	Registered Number P156768
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED PLAN. THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET. Registered Land Surveyor. 10/5/2010 Date	LENGTHS IN METRES

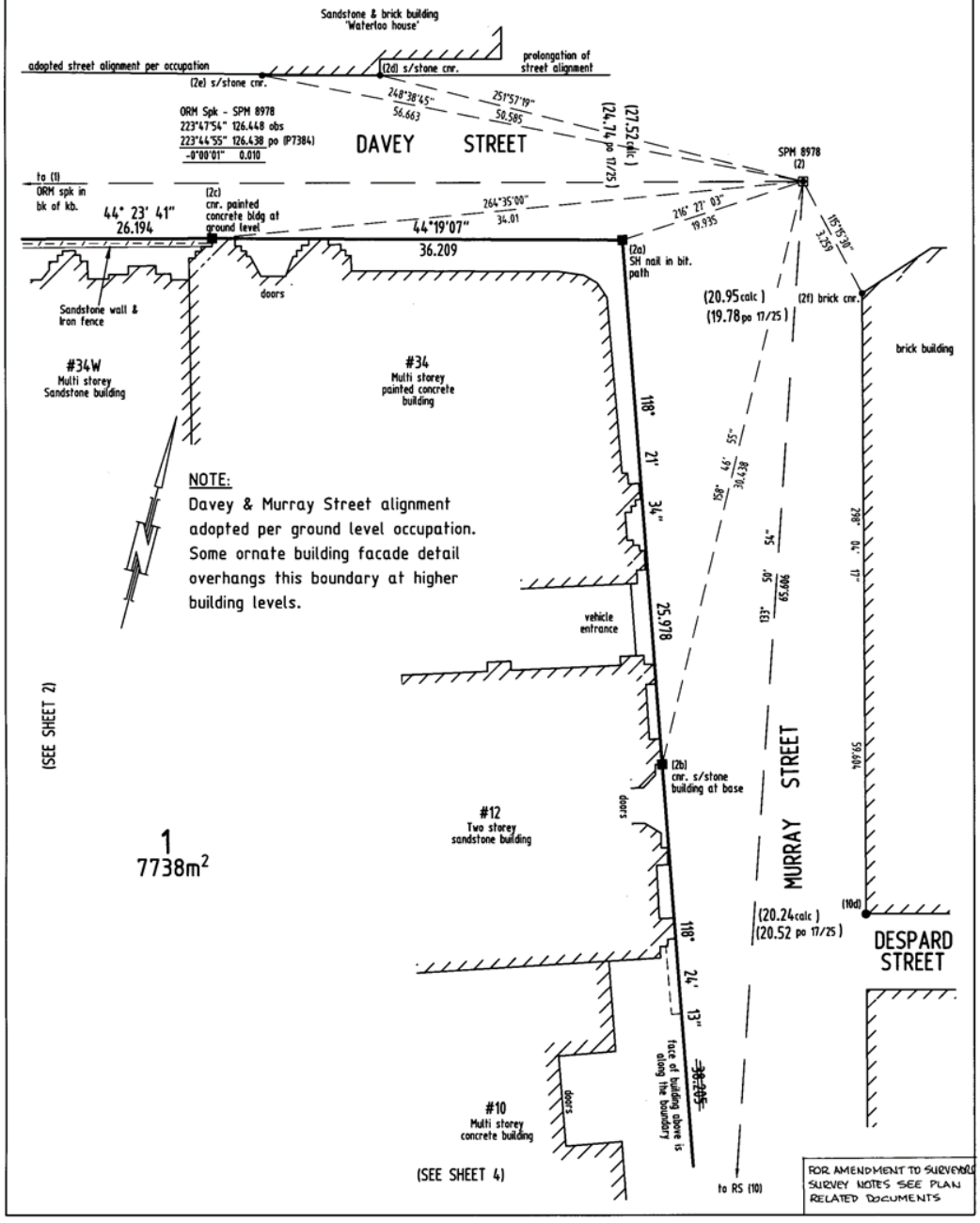


SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY NOTES ANNEXURE SHEET SHEET 3 OF 7 SHEETS	OWNER THE CROWN FOLIO REFERENCE	Registered Number P156768
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED PLAN. THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET Registered Land Surveyor 10/5/2010 Date	LENGTHS IN METRES

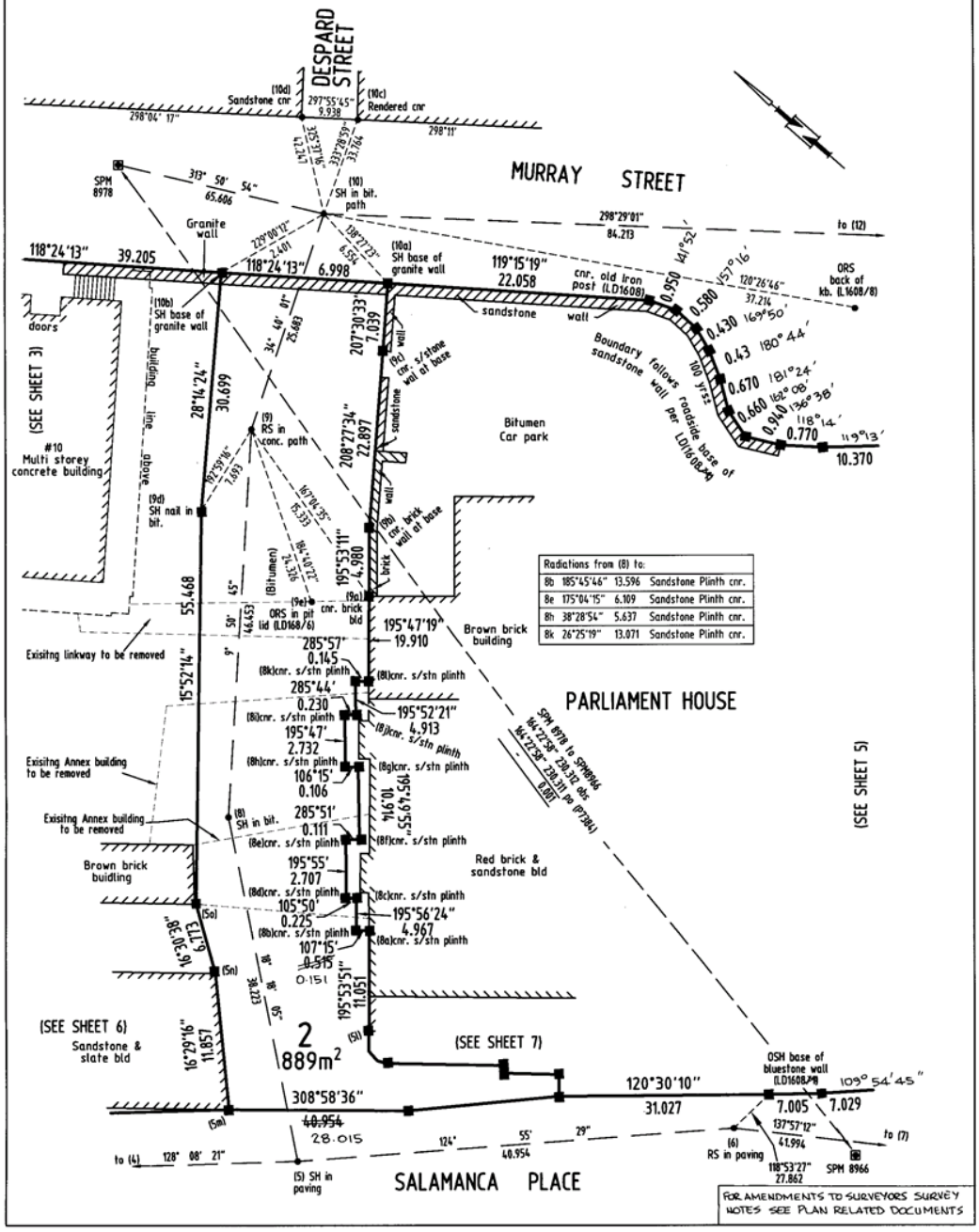


SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY NOTES ANNEXURE SHEET SHEET 4 OF 7 SHEETS	OWNER THE CROWN FOLIO REFERENCE	Registered Number P156768
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED PLAN> THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET Registered Land Surveyor Date 10/5/2020	LENGTHS IN METRES

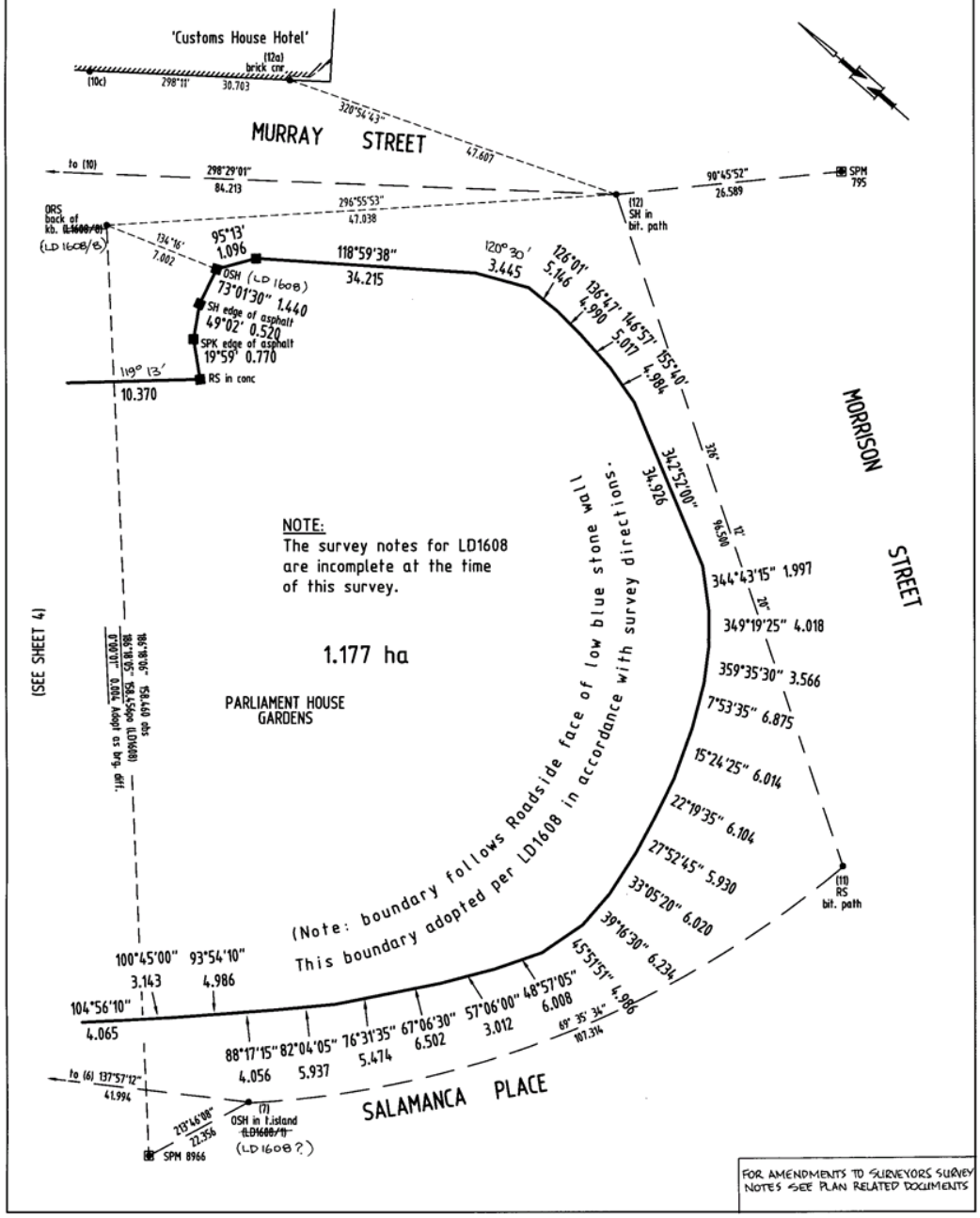


SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY NOTES ANNEXURE SHEET SHEET 5 OF 7 SHEETS	OWNER THE CROWN FOLIO REFERENCE THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED PLAN> THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET Registered Land Surveyor — Date 10/5/2010	Registered Number 156768
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY		LENGTHS IN METRES



SURVEY NOTES

RECORDER OF TITLES

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SURVEY NOTES ANNEXURE SHEET SHEET 6 OF 7 SHEETS	OWNER THE CROWN FOLIO REFERENCE	Registered Number P156768
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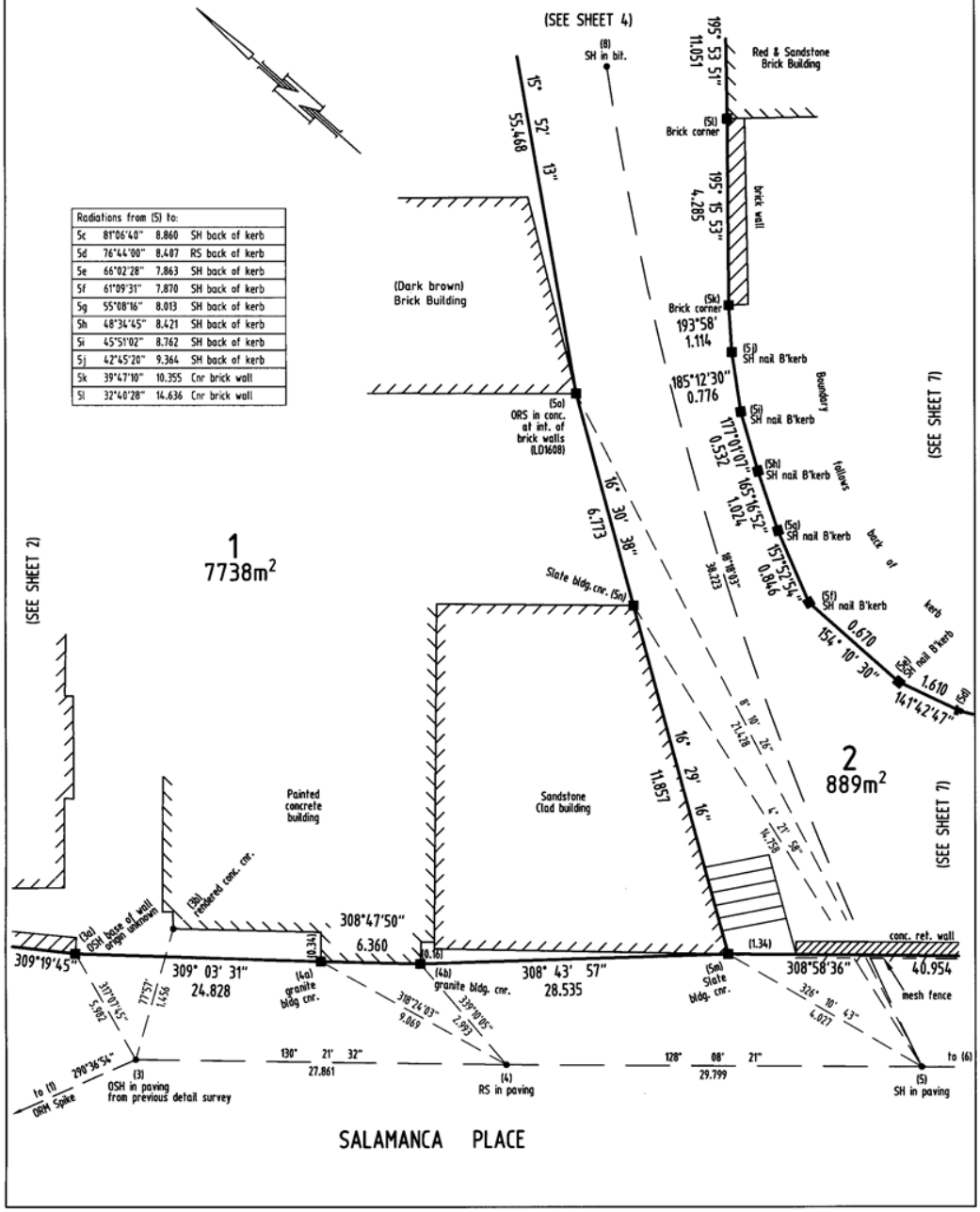
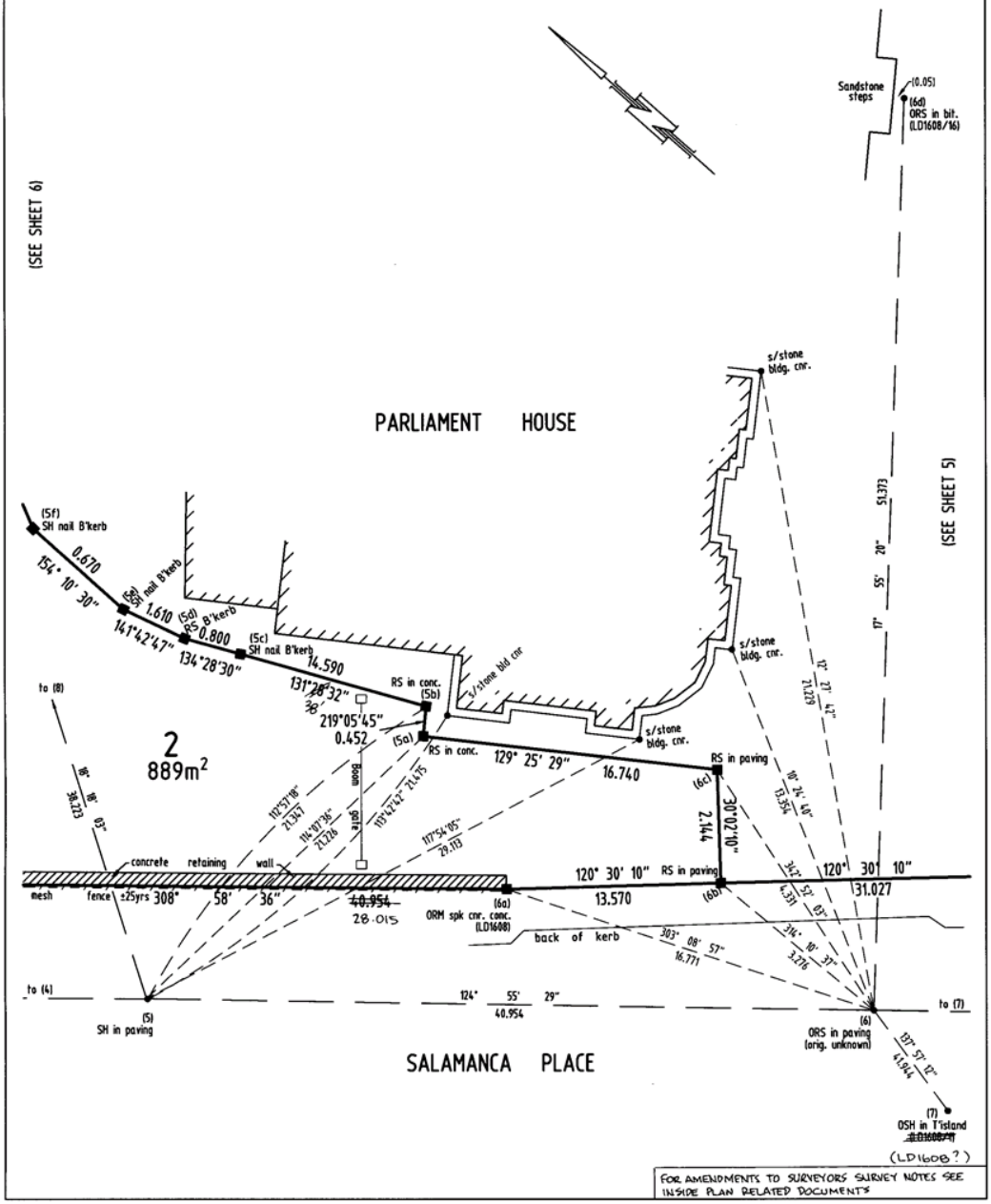


SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY NOTES ANNEXURE SHEET SHEET 7 OF 7 SHEETS	OWNER THE CROWN FOLIO REFERENCE	Registered Number P156768
CROSS REFERENCE PLAN NUMBERS USED AS PART OF THIS SURVEY	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED PLAN. THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET Registered Land Surveyor 10/5/2010 Date	LENGTHS IN METRES

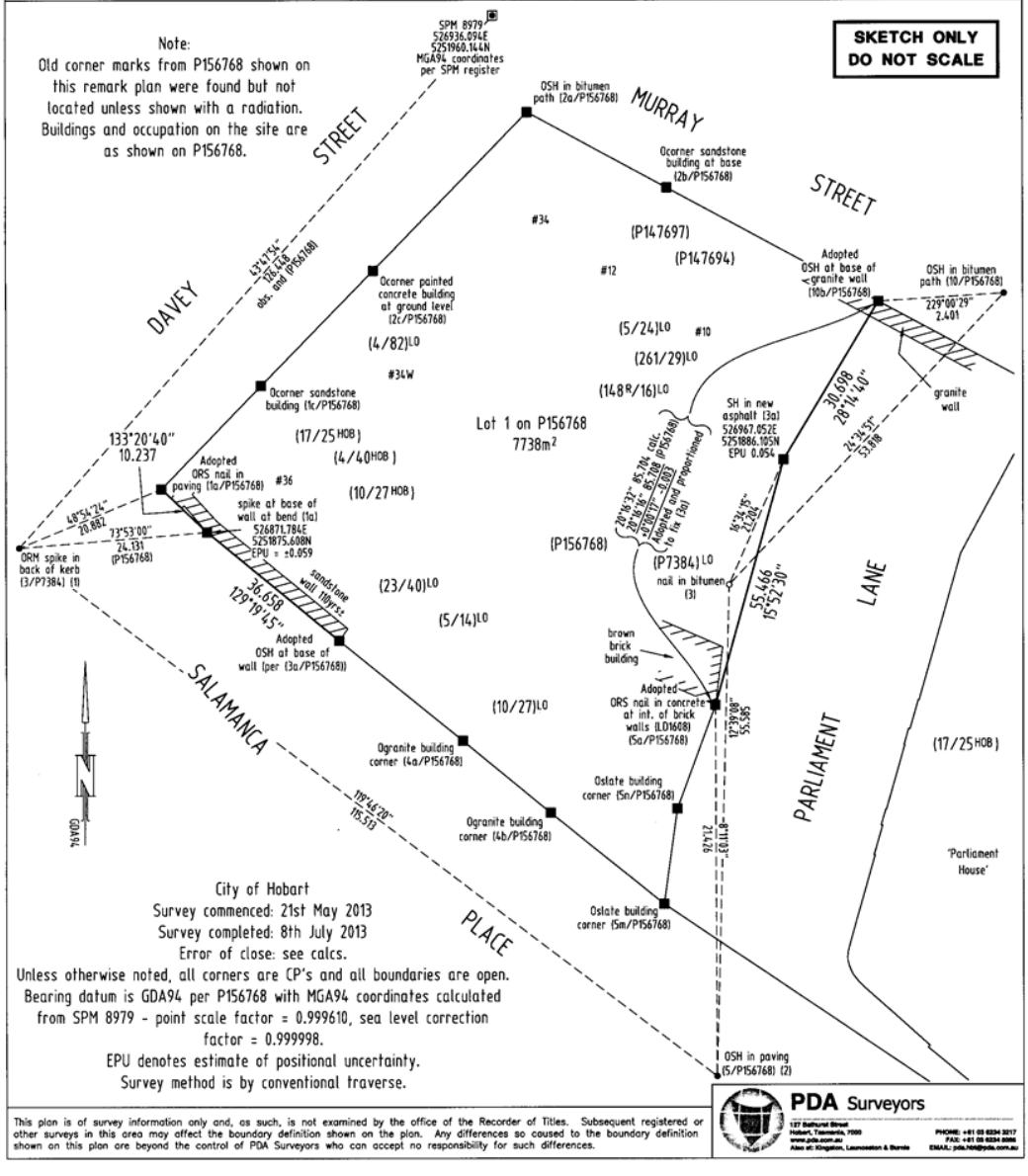


SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY INFORMATION ONLY SURVEY NOTES DEPOSITED FOR PUBLIC RECORD (SEE LTO CIRCULAR 1 OF 2007)	MAIN L.T.O PLAN (TO BE FILED WITH) P156768
PURPOSE: Partial remark of C. T. 156768-1	SIO REFERENCE **166162**
LOCATION 34 Davey Street, Hobart OWNER The Crown FOLIO REFERENCE C. T. 156768-1 GRANTEE Whole of lot 1, 7738m², The Crown LENGTHS IN METRES	SURVEY CERTIFICATE I, Simon Roberts of Hobart in Tasmania, a Registered Land Surveyor, HEREBY CERTIFY that: (a) this survey is based upon the best evidence that the nature of the case admits; (b) the survey notes have been truly compiled from surveys made by me or made under my supervision; and (c) this survey and accompanying survey notes comply with relevent legislation affecting surveys and are correct for the purpose required. Signature Date 12 / 7 / 2013
SURVEYORS REF No: Q903C-6	SHEET 1 OF 1 SHEETS



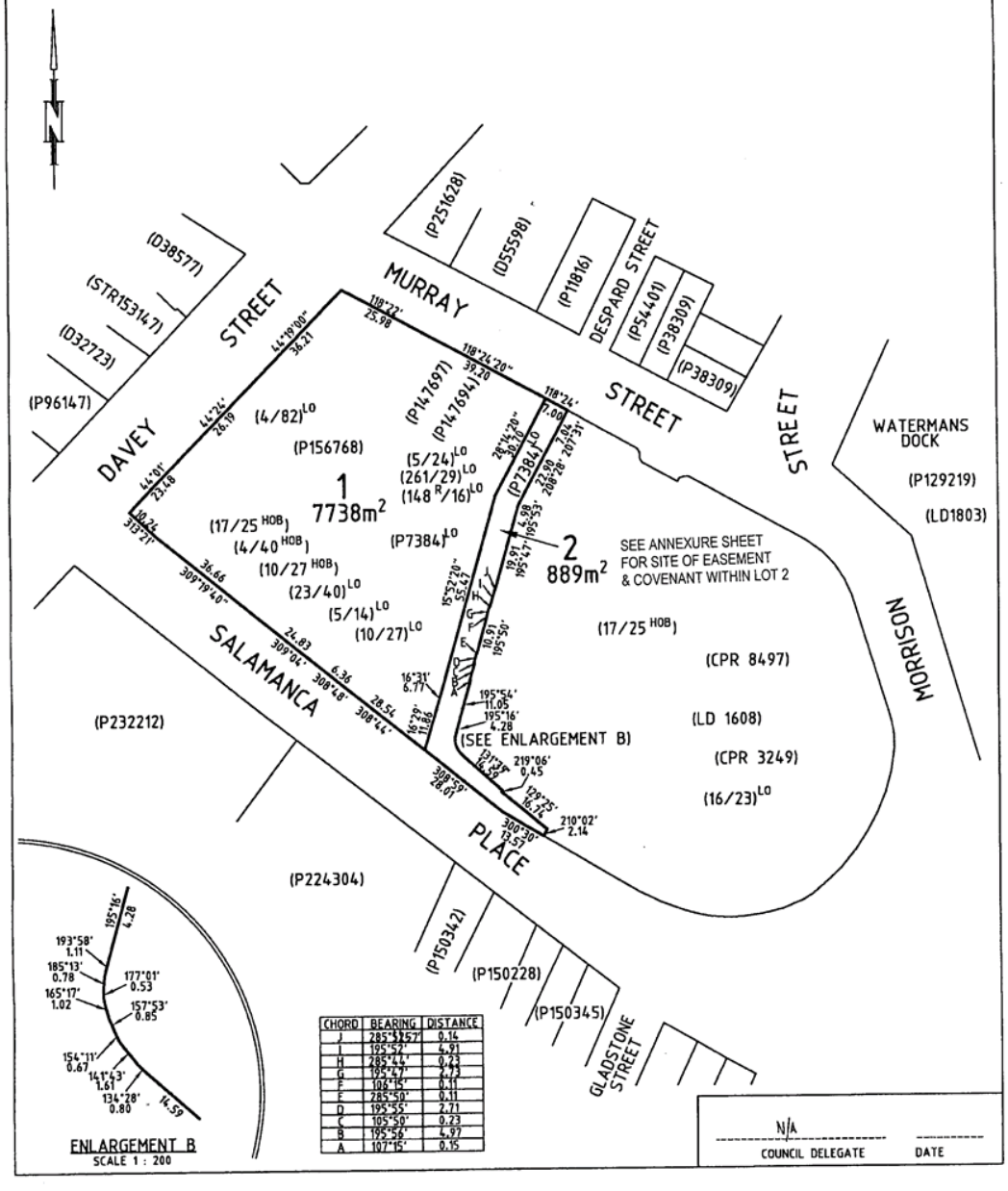
This plan is of survey information only and, as such, is not examined by the office of the Recorder of Titles. Subsequent registered or other surveys in this area may affect the boundary definition shown on the plan. Any differences so caused to the boundary definition shown on this plan are beyond the control of PDA Surveyors who can accept no responsibility for such differences.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

OWNER THE CROWN	PLAN OF SURVEY		REGISTERED NUMBER P156768
FOLIO REFERENCE SEC.27A APPN.(C.944740)	BY SURVEYOR C. M. TERRY of PEACOCK, DARCEY & ANDERSON PTY LTD 127 BATHURST STREET, HOBART		
GRANTEE LOT 1 ON (P.156768) 7738m² & LOT 2 ON (P.156768) 889m² THE CROWN. CROWN LAND (PARLIAMENTARY PRECINCT REDEVELOPMENT ACT) 1999	LOCATION CITY OF HOBART		APPROVED ~~EFFECTIVE~~ FROM 18 JUN 2010 Alice Kawa Recorder of Titles
	SCALE: 1:1000	LENGTHS IN METRES	SURVEYORS REF: L752C
MAPSHEET MUNICIPAL CODE No. 114 (5225-52)	LAST UPI No —	LAST PLAN No. P147697 P147694	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

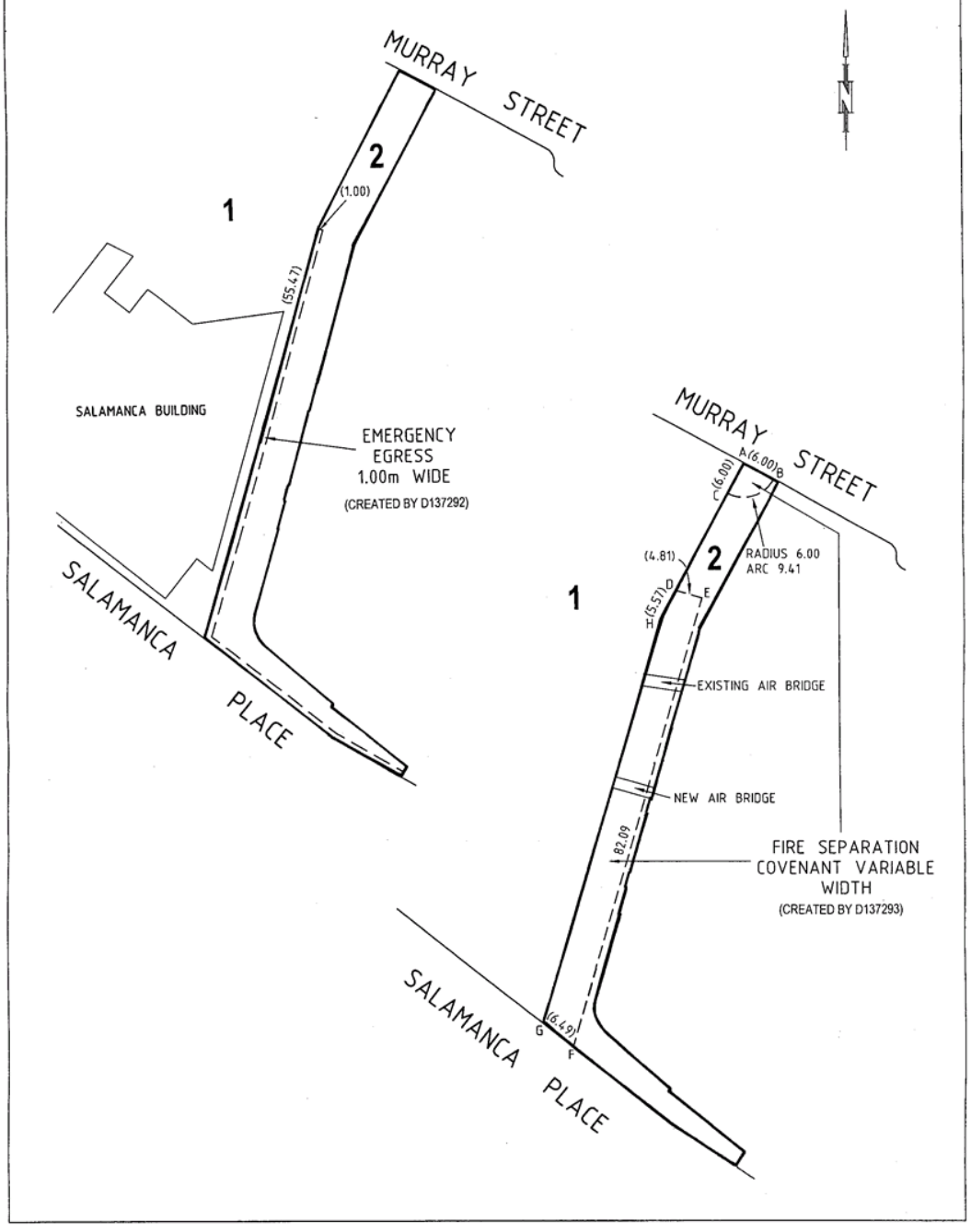


FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

PLAN OF TITLE ANNEXURE SHEET SHEET 1 OF 1 SHEETS	OWNER THE CROWN FOLIO REFERENCE SEC 27A APPN. C944740 SCALE 1: 600 LENGTHS IN METRES	Registered Number **P156768**



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
156768	1
EDITION	DATE OF ISSUE
6	02-Feb-2015

SEARCH DATE : 31-Mar-2017
SEARCH TIME : 05.32 PM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Plan 156768 (Section 27A of the Land Titles Act.)
Derivation : Whole of Lot 1 on Plan 156768 Gtd. to The Crown

SCHEDULE 1

D137280 TRANSFER to PARLIAMENT SQUARE HOBART LANDOWNER PTY LTD Registered 02-Feb-2015 at noon

SCHEDULE 2

C944740 Land is limited in depth to 15 metres, excludes minerals and is subject to reservations relating to drains sewers and waterways in favour of the Crown
D137280 Land is limited in depth to 15 metres, excludes minerals and is subject to reservations relating to drains sewers and waterways in favour of the Crown
D137280 FENCING PROVISION in Transfer
D106381 LEASE to THE CROWN of a leasehold estate for the term of 10 years from 15-Dec-2014 (of that part of the said land being Lot 1 on Plan 168352) Registered 02-Feb-2015 at 12.01 PM
D152526 INSTRUMENT Creating Restrictive Covenants for The Crown Registered 02-Feb-2015 at 12.02 PM
D152527 INSTRUMENT Creating Restrictive Covenants for The Crown Registered 02-Feb-2015 at 12.03 PM
D106382 MORTGAGE to The State of Tasmania Registered 02-Feb-2015 at 12.04 PM
D106383 MORTGAGE to National Australia Bank Limited Registered 02-Feb-2015 at 12.05 PM
E56883 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 01-Jul-2016 at noon
E62832 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 22-Sep-2016 at noon
D137292 BENEFITING EASEMENT: a right of emergency egress over the land marked Emergency Egress 1.00 Wide on plan

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

156768 Registered 02-Feb-2015 at 12.07 PM

UNREGISTERED DEALINGS AND NOTATIONS

172064	PLAN Lodged by PEACOCK DARCEY - H on 22-Feb-2017 BP: 172064
E45499	RELEASE of Lodged by CROWN SOLICITOR on 27-Mar-2017 BP: E45499
E45500	DISCHARGE of RESTRICTIVE COVENANT Lodged by CROWN SOLICITOR on 27-Mar-2017 BP: E45499
E45502	INSTRUMENT Creating Restrictive Covenants Lodged by CROWN SOLICITOR on 27-Mar-2017 BP: E45499

Application Referral Cultural Heritage - Response

From:	Brendan Lennard
Recommendation:	Proposal is unacceptable.
Date Completed:	
Address:	34 DAVEY STREET, HOBART
Proposal:	Partial Demolition, Alterations and Extension to Previously Approved Development
Application No:	PLN-18-798
Assessment Officer:	Ben Ikin,

Referral Officer comments:

Proposal

The proposal involves construction of an additional level (Level 03) behind the existing façade of the building known as 12 Murray Street. The additional level connects with Level 03 (Presidential Suite) of the previously approved new building which replaces the former 10 Murray Street State Office building. The new work will be set back approximately 2 metres from the building façade.

The existing building

The existing structure is the remnant two-storey, Inter-War Gothic Revival sandstone façade of a former office building. It is well-detailed and solidly constructed, featuring a parapet, pilasters which divide the façade into three bays, and a pediment surmounting the pronounced arched entrance.

12 Murray Street was constructed as the head office of the former Hydro-Electric Department (later Commission). The building was constructed in 1921 and 1922, with the offices first occupied in July 1922. The architectural design of the building has an interesting background. It was originally intended to locate this building in Davey Street, and its Tudoresque Gothic design bore a deliberate relationship with the two other government buildings in Davey Street – the former 1847-48 St Mary's Hospital / Lands and Survey Department offices (Alexander Dawson and William Porden Kay) and the 1884 Government Printing Office / Public Works Department building (William Waters Eldridge) – both representing similar architectural vocabulary. It was envisaged that the Hydro-Electric Department offices would complement the suite of Davey Street government buildings. Issues related to site and foundation conditions forced relocation of the Hydro-Electric Department offices to its Murray Street site. The Gothic design was retained – probably appearing somewhat 'old-fashioned' by 1922.

The Hydro-Electric Department building was constructed during an important phase in the expansion of electricity generation and distribution throughout Tasmania, and was the first time the department had its own building (it had previously leased office space). The rear of the building was utilitarian, in contrast to the relatively ornate façade.

The building is recognised as a Place of Cultural Significance in Table 1 of Schedule 1 of the *Sullivans Cove Planning Scheme 1997*. It is also on the Tasmanian Heritage Register.

The Planning Scheme

Schedule 1 of the *Sullivans Cove Planning Scheme 1997* includes the following submission requirements:

22.4.3 Submission Requirements

All applications for 'building or works' must satisfy the relevant submission requirements of clause 9.2 of the Scheme. In addition, pursuant to s.54 of the *Land Use Planning and Approvals Act 1993*, the following information may be required:

• A Conservation Plan as defined in Clause 22.3.

• Street elevations or 'true perspectives' to show the scale and impact of 'building or works' on places of cultural significance.

In this instance, a separate conservation plan was not requested or submitted, as one had been previously submitted (*Parliament Square, Hobart – Conservation Management Plan, January 2009*.)

The Conservation Plan recognises the significance of 12 Murray Street and its relationship with the two other Gothic-styled sandstone government buildings. It also notes its historical importance in terms of the Hydro-Electric Department (later Commission). The Conservation Plan states that the 'style, scale and materials [of 12 Murray Street] reflect a desire to create a harmonious governmental precinct.'

The Conservation Plan states that the façade must be retained with a high degree of external integrity and conservation. (7.3.2)

The exterior appearance of the site, which is a result of the existing form, external surfaces, materials and finishes of significant facades, should be preserved. … No new work should compromise the original significant facades. (7.4.1)

Where it is necessary to modify a façade, changes to the façade should reinforce the composition of the original façade. (7.4.2)

Despite the favourable assessment of the Heritage Impact Statement prepared by Design 5 – Architects Pty Ltd and submitted in support of the proposal, the proposal is not considered to be in compliance with the policies espoused in the Conservation Plan.

Relevant Scheme Provisions

22.4.5 'Discretionary' 'Building or Works'

'Building or works' on places of cultural significance which cannot satisfy the 'deemed to comply' provisions of Clause 22.4.4 may be approved at the discretion of the Planning Authority.

The following criteria must be taken into consideration in the assessment of all proposals to undertake 'building or works' on places of cultural significance:

• 'Building or works' must complement and contribute to the cultural significance, character and appearance of the place and its setting;

• 'Building or works' must be in compliance with the conservation strategy of an approved Conservation Plan, where required and/or provided;

.

• The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any place of cultural significance;

• 'Building or works' must not reduce the apparent authenticity of places of cultural significance by mimicking historic forms;

• 'Building or works' may be recognisable as new but must not be individually prominent;

• The painting of previously unpainted surfaces is discouraged.

Assessment

The proposed works do not complement and contribute to the cultural significance, character and appearance of the place. The proposed work is an incompatible contemporary addition, destroying the architectural expression of the existing building and its historical relationship with other former government buildings. The historic façade will appear nothing more than just a façade – a 'postage stamp' on the overall envelope of new development.

The proposal does not comply with the conservation strategy of the submitted Conservation Plan.

The location, bulk and appearance of the proposed work will adversely affect the heritage values of the existing façade, altering the relationship of the parapet with the space beyond, and providing an incongruent element which will inevitably be more closely associated visually with the adjacent new development, reducing the appearance of the façade to that of an ill-fitting mask.

The proposal fails to meet key conservation provisions, and warrants refusal.

Tasmanian Heritage Council

The Tasmanian Heritage Council has granted conditionally consent to the proposed works. The conditions relate to:

1. Archaeology
2. Protection of façade
3. Relationship of new floors to existing façade
4. 2m setback and façade design issues

Section 39 (9) of the *Historic Cultural Heritage Act 1995* sets out requirements of the planning authority if the Heritage Council consents to the discretionary permit being granted subject to the conditions specified in the notification (as in this case):

(9) If subsection (6)(b) applies and the relevant planning authority grants the discretionary permit –

(a) it must do so subject to (at least) the conditions required by the Heritage Council; and

(b) it must not make the discretionary permit subject to a condition that conflicts with any condition required by the Heritage Council.

Notwithstanding the consent of the THC, the planning authority is not bound to approve the proposed works. The planning authority may still refuse to grant the discretionary permit, and ultimately, this is considered to be the appropriate course.

Reasons for refusal:

The proposal fails to comply with the requirements of clause 2.4.5 'Discretionary' 'Building or Works' of the *Sullivans Cove Planning Scheme 1997* as:

(a) It does not complement and contribute to the cultural significance, character and appearance of the place.

(b) It does not comply with the conservation strategy of the submitted Conservation Plan.

(c) The location, bulk and appearance of the proposed work will adversely affect the heritage values of the existing façade.

7.2 APPLICATIONS UNDER THE HOBART INTERIM PLANNING SCHEME 2015

7.2.1 2 COLLINS STREET AND ADJACENT ROAD RESERVE HOBART - DEMOLITION AND NEW DEVELOPMENT FOR VISITOR ACCOMMODATION, FUNCTION CENTRE AND ASSOCIATED FACILITIES PLN-16-1133 - FILE REF: F19/2281

Address:	2 Collins Street and Adjacent Road Reserve Hobart
Proposal:	Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities
Expiry Date:	6 February 2019
Extension of Time:	Not applicable
Author:	Cameron Sherriff

RECOMMENDATION

That pursuant to the *Sullivans Cove Planning Scheme 1997*, the Council refuse the application for demolition and new development for visitor accommodation, function centre and associated facilities at 2 Collins Street and adjacent road reserve, HOBART for the following reasons:

1. The proposed function centre does not meet the Objectives of Clause 15.2 of the *Sullivans Cove Planning Scheme 1997*, as it:

    a) Fails to ensure that the building masses and facades appropriately relate to the spaces they form.

    b) Fails to ensure that the proposed non-residential use is based on the amenity and characteristics of specific sites.

    c) Fails to ensure that the amenity of or the potential for adjacent residential development will not be diminished.

    and is therefore considered to be prohibited under clause 15.3.4 of the *Sullivans Cove Planning Scheme 1997.*

2. The proposal does not meet the performance standards of clause 22.5.5 of the *Sullivans Cove Planning Scheme 1997*, as:

   a) It will dominate adjacent places of cultural significance when viewed from the street or any other public space, and will be more prominent in the street than the adjacent places of cultural significance contrary to the Cultural Resource Principles (Cultural Heritage and Urban Character) of the *Sullivans Cove Planning Scheme 1997* espoused in clause 7.3.2.

   b) The area of the facade of the new building will exceed that of the buildings on adjacent places of cultural significance and the visual impact of the apparent disparity of scale is significant and historic precedent does not warrant the scale disparity.

   c) The proposal fails to complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.

   d) The location, bulk and appearance of the proposed building will adversely affect the heritage values of adjacent and nearby places of cultural significance, by creating an incongruous backdrop out of scale with the present visual setting.

3. The proposal exceeds the 'deemed to comply' height, alignment, plot ratio, apparent size and building surfaces standards of clause 23.6.1A and 23.7.1 of the *Sullivans Cove Planning Scheme 1997* and in turn fails to meet the objectives of clause 23.2, in that:

   a) It fails to conserve the traditional urban pattern of the Cove.

   b) Its bulk and height does not reflect the natural topography of the Sullivans Cove Planning Area, the ampitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.

   c) It does not promote a respectful relationship between buildings and to buildings of identified cultural significance within a street.

d) The building will be individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.

e) The building does not facilitate the creation of 'secondary spaces' on lots in the Cove.

4. The proposal exceeds the maximum 'permitted' height standards and exceeds the standards for apparent size of clause 23.6.1A of the *Sullivans Cove Planning Scheme 1997* and does not meet the corresponding discretionary provisions of clause 23.6.2, as it will be more prominent in the streetscape than adjacent Places of Cultural Significance, by strong contrast of scale, height, colour and tone.

5. The proposal does not meet the provisions of clause 28.5 and clause 28.6 of the *Sullivans Cove Planning Scheme 1997*, as it involves the demolition of a building which (a) contributes to the urban character of the Activity Area, and (b) is capable of continued beneficial use. The proposed demolition will have a detrimental impact on the character of the Activity Area.

Attachment A: PLN-16-1133 - 2 COLLINS STREET HOBART TAS 7000 - Planning Committee or Delegated Report ⇩

Attachment B: PLN-16-1133 - 2 COLLINS STREET HOBART TAS 7000 - CPC Agenda Documents ⇩

City of HOBART

APPLICATION UNDER SULLIVANS COVE PLANNING SCHEME 1997

Type of Report:	Committee
Council:	14 January 2019
Expiry Date:	6 February 2019
Application No:	PLN-16-1133
Address:	2 COLLINS STREET , HOBART ADJACENT ROAD RESERVE
Applicant:	(Fragrance TAS-HOBART (Collins) Pty Ltd) C/O PO Box 1271
Proposal:	Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities
Representations:	1459
Performance criteria:	Use; Conservation of Cultural Heritage Values; Urban Form; Public Urban Space; Demolition

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1. Executive Summary

1.1 Planning approval is sought for Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities at 2 Collins Street and adjacent road reserve, Hobart.

1.2 More specifically the proposal includes:

- The demolition of existing buildings, and the construction of a new hotel with 16 floors (plus roof and rooftop plant) including 256 hotel rooms, conference facilities including a 1000 seat conference hall, meeting spaces, two restaurants, a retail space, a pool and wellness centre, three levels of above ground carparking (167 spaces), full size coach parking and works in, over and under the Collins Street and Ragged Lane Road Reservations, including the removal of an established street tree on Collins Street.
- The building is proposed to have a height of approximately 55 metres to the top of its rooftop plant. The total gross floor area of the proposed building is 24,270m2.
- The proposed building is finished externally with a combination of materials - Alucabond or similar cladding; sandstone facing; powder coated steel elements; perforated mesh; Alucabond or similar louvres; off form concrete panels; curtain wall glazing; glazed window suites; and timber soffit lining for its Collins Street feature awning.

1.3 The proposal relies on performance criteria to satisfy the following standards and codes of the Sullivans Cove Planning Scheme 1997:

1.3.1 Activity Area Controls - Use
1.3.2 Schedule 1 - Conservation of Cultural Heritage Values: Adjacency; Archaeology
1.3.3 Schedule 2 - Urban Form: Building Form; Building Surfaces
1.3.4 Schedule 3 - Public Urban Spaces
1.3.5 Schedule 7 - Demolition

1.4 Fourteen-hundred and Fifty Nine (1459) representations to the proposal were received within the statutory advertising period between 17 August and 31 August 2018. Of these, three (3) were supportive of the proposal.

1.5 The proposal is recommended for refusal.

1.6 The final decision is delegated to the Council.

2. Site Detail

Image 1: Aerial view of the subject property and surrounds.

2.1 2 Collins Street, Hobart is situated on the corner of Collins Street and Brooker Avenue, with Ragged Lane running along the majority of the south-western boundary of the property. The site includes an existing warehouse-style building (formerly Roberts) occupying the north-eastern half of the property, with a carpark and a semi-enclosed former Council garage building in the south-western corner of the site. The site backs onto the site of The Old Woolstore Apartment Hotel, and residential properties of Wapping are nearby across Ragged Lane. There is a large area of paved highway reservation in front of the property at the bottom end of Collins Street that includes street trees and a prominent sculpture and water feature. 2 Collins Street has a total area of 3009m^2.

2.2 Photos of the site and surrounds:

Plate 1: The subject site as viewed from the intersection of Collins Street and Brooker Avenue. Note the former Roberts building to the left and the former Council garage to the right, with the green/grey Woolstore building behind.

Plate 2: Looking back to the site from along Collins Street. The tree in the centre of the image is proposed to be removed.

Plate 3: Looking up Collins Street from the opposite side of Brooker Avenue with the subject site on the left. Note the sculpture and water feature which is proposed to remain in the widened pavement of the Highway Reservation in this location.

Plate 4: Looking towards the site from the opposite side of the Brooker Avenue/Tasman HIghway/Macquarie Street/Davey Street intersection. Note the Hospital redevelopment rising behind, and part of the Woolstore building to the left of the site.

Plate 5: The internal rear of the site as viewed from the end of Crewswells Row, which is adjoined by the Woolstore site and residential properties of Wapping. The former Roberts building lies in the centre of the image.

Plate 6: Looking up Ragged Lane towards Collins Street, with the subject site (and former Council garage building) on the right and residential properties of Wapping on the left.

3. Proposal

3.1 Planning approval is sought for Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities 2 Collins Street and adjacent road reserve, Hobart..

3.2 More specifically the proposal is for:

- The demolition of existing buildings, and the construction of a new hotel with 16 floors (plus roof and rooftop plant), 256 hotel rooms, conference facilities including a 1000 seat conference hall, meeting spaces, two restaurants, a retail space, a pool and wellness centre, three levels of above ground carparking (167 spaces), full size coach parking and works in, over and under the Collins Street and Ragged Lane Road Reservations, including the removal of an established street tree on Collins Street.
- The building is proposed to have a height of approximately 55 metres to the top of its rooftop plant. The total gross floor area of the proposed building is 24,270m^2.
- The proposed building is finished externally with a combination of materials - Alucabond or similar cladding; sandstone facing; powder coated steel elements; perforated mesh; Alucabond or similar louvres; off form concrete panels; curtain wall glazing; glazed window suites; and timber soffit lining for its Collins Street feature awning.

3.3 Proposal images:

Image 2: Architect's render of the proposed development (Excerpt from proposal plans).

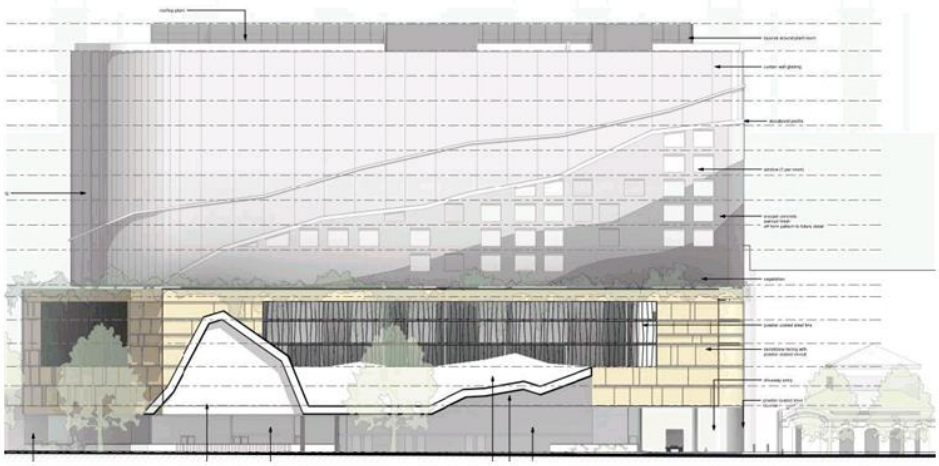


Image 3: Collins Street Elevation (Excerpt from proposal plans).

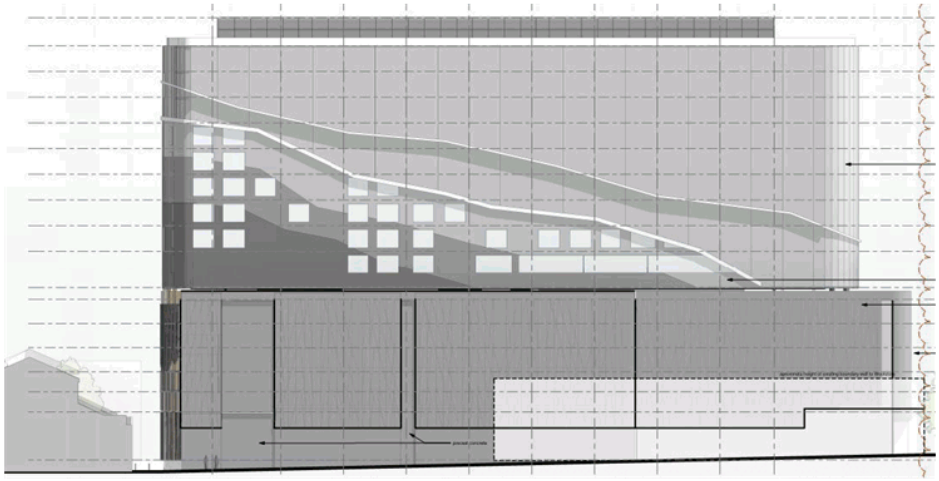


Image 4: South East Elevation (from Woolstore) (Excerpt from proposal plans).

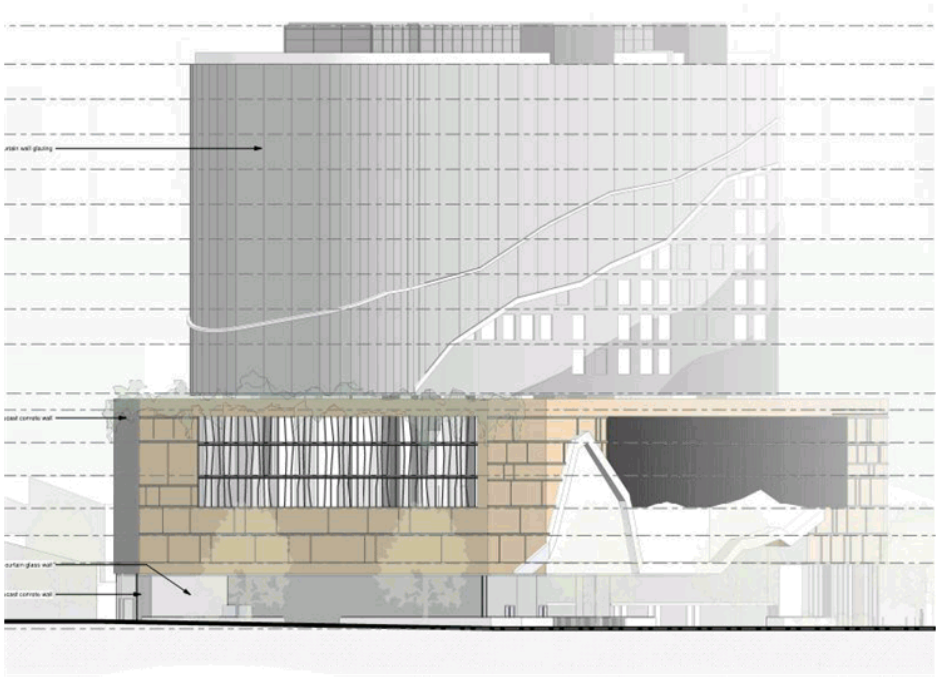


Image 5: Brooker Avenue Elevation (Excerpt from proposal plans).

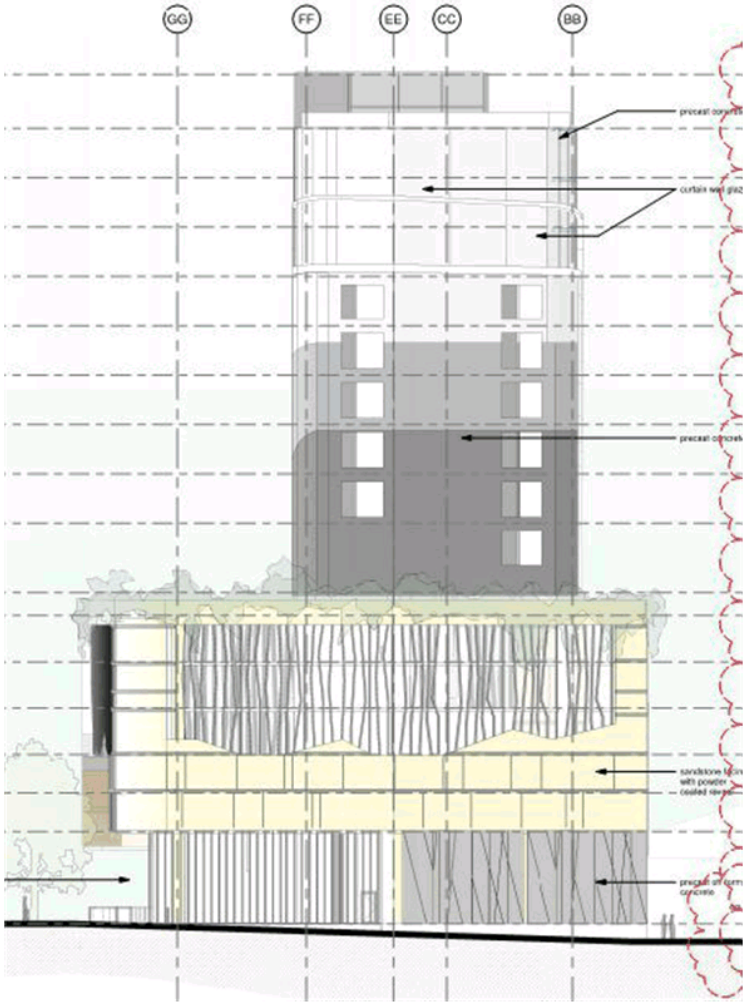


Image 6: Ragged Lane Elevation (Excerpt from proposal plans).

4. Background

4.1 When originally submitted in October 2016, the application was of a different, taller design than that currently being considered, being 23 floors with 479 hotel rooms and a height of around 84m to the top of rooftop plant and around 94m to the top of a spire which was part of an external design feature. Revisions to the proposal were made voluntarily by the applicant during the period where additional information was being sought by assessing officers.

4.2 Landlord consent was sought and granted for the associated works within the road reservations adjacent to the site in May 2017. Due to revisions made to the proposal during the period where additional information was being sought, this initial landlord consent was invalidated and the applicant was required to reapply for new consent based on the revised proposal. This secondary landlord consent was granted in April 2018.

5. Concerns raised by representors

5.1 Fourteen-hundred and Fifty-nine (1459) representations to the proposal were received within the statutory advertising period between 17 August and 31 August 2018. Of the total amount received, three (3) were supportive of the proposal.

5.2 The following table outlines the concerns raised in the representations received. Those concerns which relate to a discretion invoked by the proposal are addressed in Section 6 of this report.

Lack of compliance with Scheme standards, most notably for height and plot ratio. Fails to meet the Objectives of the Scheme. The proposal will be negatively visually prominent and will impede valued sightlines from within and around the city. Poor design – monstrous, ghastly, ugly, grotesque, boring, disgraceful and disrespectful – a tacky eyesore. Lack of vision in its design with no attempt made to think creatively to produce a good development outcome. Inappropriate height, bulk and materials. The building would be an unwelcome landmark. Potentially the most hideous development ever submitted for a DA in Hobart.
Height limitations should be adhered to.
Entirely unwelcome proposal. An insult. Insane. A sick joke. Approval would set a dangerous precedent. It is completely insensitive to its location and suggests greed above all else and a quick cash grab for overseas investors. Why has it gotten this far when it clearly acknowledges that it does not comply with applicable standards? Complete lack of understanding or consideration of what is appropriate for the area. The developer seems to be trying to take over Hobart with little regard for the rules or what is appropriate or needed. The proposal is arrogant and disrespectful.
Concerns around foreign investment.
The need for such a development is arguable and hardly justified in the proposal. The rush to capitalise on increased tourism puts at risk the attributes of the city that are valued so highly.

May cause traffic and parking problems. Roads and transport networks are not geared towards such overdevelopment.
The proposal's design offers little in the way of street level interaction. Provides nothing for locals.
Taller buildings should be located away from the city centre.
Any attempt to use existing buildings as examples for why a taller building is appropriate presents as a flawed argument. The arguments put forward in the supporting planning report are flawed and without merit.
Out of character, context and out of sync with the area and the City overall and its skyline. It is inappropriate and unsympathetic. High-rise buildings should not be allowed. Threatens the human scale, beauty, integrity and charm of Hobart, which should be preserved. The development would ruin Hobart, which does not need such tall buildings. The best cities in the world do not have high rise buildings.
Development should comply with the height limitations recommended by Leigh Woolley.
Presents the type of building that visitors to Tasmania and Hobart do not want to see. Visitors value the fact that Hobart is not dominated by such developments. The proposal is the complete opposite of what makes the city unique. Such buildings have their place in many other cities throughout the world which have already been ruined by this type of development being allowed. Why kill all that is worthwhile about Hobart all for the sake of becoming just another city that could be anywhere and profiting a few.
Amenity impacts upon residential properties close to the subject site – will block sunlight and will overshadow, may exacerbate the effects of wind tunnelling.
Negatively impacts upon and does not complement immediate and wider heritage and landscape values. Hobart is a small scale heritage city.
If the development must include car parking, why not within a basement instead of adding to the overall above ground level height?

6. Assessment

6.1 The *Sullivans Cove Planning Scheme 1997* is a performance based planning scheme. This approach recognises that there are in many cases a number of ways in which a proposal can satisfy desired environmental, social and economic standards. In some cases a proposal will be 'permitted' subject to specific 'deemed to comply' provisions being satisfied. Performance criteria are established to provide a means by which the objectives of the planning scheme

may be satisfactorily met by a proposal. Where a proposal relies on performance criteria, the Council's ability to approve or refuse the proposal relates only to the performance criteria relied on.

6.2 The site is located in the Activity Use 1.0 Inner City Residential Area of the *Sullivans Cove Planning Scheme 1997*.

6.3 The existing use of the site is limited to 'Carpark' with the existing buildings having been vacated some time ago. The proposed use is a combination of Visitor Accommodation and Function Centre. The existing Car Park use is a discretionary use in the Activity Area. The proposed uses are permitted (Visitor Accommodation) and discretionary (Function Centre) uses in the Activity Area.

6.4 The proposal has been assessed against:

6.4.1 Parts A and B – Strategic Framework

The Strategic Framework found in Part B clause 6.2 - Designing the Future Urban Form of the Sullivans Cove Planning Scheme 1997 includes the following:

The built and spatial qualities of Sullivans Cove are a product of its unique historic cultural heritage. This must be retained, for once lost, it cannot be recreated.

This means more than retaining buildings of historical value. The future urban form of the Cove should respond to the quality of spaces and buildings which exist within the Cove.

Future developments within the Cove should respect the scale of the Cove's built form – new buildings should not be out of scale with neighbouring buildings, or the general character of the Cove.

Of note under the Guiding Principles of Part B clause 7.3.1 are the following statements, of particular relevance to the proposal:

Cultural Resource Principles: Cultural Heritage -

- *To facilitate use and development which is compatible with conservation of the Cove's cultural heritage values.*
- *To encourage the recycling of existing buildings through the promotion of new uses, particularly in buildings of identified cultural heritage value.*

- *The recognisable historic character of Sullivans Cove is not to be compromised by new development which overwhelms the historic spaces and buildings, or, by new development which reduces the apparent authenticity of the historic places by mimicking historic forms.*

Cultural Resource Principles: Urban Character -

- *Changes to urban character will be consistent with conservation of cultural significance and maritime and historic character of Sullivans Cove.*
- *No new development or part of a development is to be individually prominent particularly when viewed from Sullivans Cove or the River Derwent. Exceptions include cranes and similar development relating to the essential operating requirements of the Tasmanian Ports Corporation.*
- *The distinctive urban form of Sullivans Cove is to be reinforced in development areas.*

Efficiency Principles -

- *The promotion of pedestrian and cycle movement, amenity and safety is the primary planning objective for movement within the Cove.*
- *The pavements, carriageways and parks of the Cove shall be improved to increase pedestrian circulation and safety, enhance the pedestrian's experience of the historic character, reduce pedestrian/vehicular conflict, yet maintain vehicular access (including parking and the movement of freight) to serve the diverse activities within the Cove.*
- *The operational requirements for safe and efficient vehicle movement related to the activities of the working port shall be facilitated.*
- *Parking supply within the Cove should be designed and administered to facilitate visitor access, rather than CBD commuters and other long-term parking space users. Long term commuter parking within the Cove should be discouraged.*
- *The visual dominance of car parking throughout the Cove should be reduced, particularly in the Central Cove area.*

Economic Development Principles -

- *A mix of retail activities, catering for the needs of tourists, visitors,*

workers and local residents is encouraged.

People in the Cove -

- *The further development of the residential and visitor accommodation in the Cove is encouraged in locations where the residential amenity will not constrain the economic functionality of the ports and other preferred industrial and commercial uses.*
- *Developments which incorporate convenience facilities, retailing, recreational activity, pedestrian amenity and visual interest will be encouraged at street level.*
  Activities such as offices, residential accommodation and studios on major pedestrian routes through the Cove should be located at first floor or above.
- *In its consideration of all applications for use or development the Planning Authority must be satisfied that the use or development:*
  - Reduces opportunities for crime to occur;
  - Provides safe, well designed and maintains buildings, facilities and public spaces;
  - minimises the potential for vandalism and anti-social behaviour; and
  - Promotes safety on neighbouring public and private land.

6.4.2 Part D – Clause 15 – Activity Area Controls

The Objectives of the Activity Area at clause 15.2 include:

- *To provide for the development of an inner city residential neighbourhood providing quality urban housing for a range of household types and income groups.*
- *To ensure that residential development is the primary focus throughout the Activity Area but allow non-residential uses to be developed on a flexible performance approach based on the amenity and characteristics of specific sites.*
- *To retain and restore where appropriate buildings of cultural significance.*
- *To ensure that building masses and facades appropriately relate to the spaces they form. Streets within the Zone be considered as spaces in their own right.*
- *To encourage architecture of the highest quality which is modern in approach but at the same time incorporate some interpretation of the history of the area as appropriate.*
- *To ensure that new development incorporate historic cues, whilst*

not relying on historical mimicry.

- *To facilitate the transition from the CBD by allowing substantial commercial uses on key sites on the main connecting streets (Campbell and Collins Streets) or in places where reasonable residential amenity is unachievable because of existing traffic or environmental impacts. These commercial uses must not themselves diminish the amenity of or the potential for adjacent residential development.*
- *To encourage frontages of commercial activity only on the ground floor of buildings abutting streets.*
- *To encourage commercial activity in existing buildings where this is required to assist in their conservation.*
- *To encourage a mix of uses on the sites in the west and north-west of the Activity Area and fronting Campbell Street.*

6.4.3 Part E – Schedule 1 – Conservation of Cultural Heritage Values

Part E – Schedule 2 – Urban Form

Part E – Schedule 3 – Public Urban Space

Part E – Schedule 5 – Traffic, Access and Parking

Part E – Schedule 7 – Demolition

Part E – Schedule 8 – Environmental Management

6.5 The proposal relies on the following performance criteria to comply with the applicable standards:

6.5.1. Activity Area Controls (Use) – clause 15.3.4

Conservation of Cultural Heritage Values - Heritage – (Adjacent) – clause 22.5.5

Conservation of Cultural Heritage Values - Archaeology – clause 22.6.5

Urban Form (Building Form) – clause 23.6.2

Urban Form (Building Surfaces) – clause 23.7.2

Public Urban Space (Building or Works) – clause 24.4.6

Demolition – clause 28.6

6.6 Each performance criterion is assessed below.

6.7 Activity Area Controls (Use) – clause 15.3.4

6.7.1 There is no acceptable solution for a Function Centre use in the Inner City Residential (Wapping) Activity Area.

6.7.2 The proposal includes a 1000 seat conference hall with associated meeting spaces.

6.7.3 There is no acceptable solution; therefore assessment against the performance criterion (or in this case the Objectives of the Activity Area) is relied on. A use that is deemed to not meet the relevant objectives is deemed to be prohibited.

6.7.4 The Objectives of the Inner City Residential (Wapping) Activity Area at clause 15.2 provide as follows:

- *To provide for the development of an inner city residential neighbourhood providing quality urban housing for a range of household types and income groups.*
- *To ensure that residential development is the primary focus throughout the Activity Area but allow non-residential uses to be developed on a flexible performance approach based on the amenity and characteristics of specific sites.*
- *To retain and restore where appropriate buildings of cultural significance.*
- *To ensure that building masses and facades appropriately relate to the spaces they form. Streets within the Zone be considered as spaces in their own right.*
- *To encourage architecture of the highest quality which is modern in approach but at the same time incorporate some interpretation of the history of the area as appropriate.*
- *To ensure that new development incorporate historic cues, whilst not relying on historical mimicry.*
- *To facilitate the transition from the CBD by allowing substantial commercial uses on key sites on the main connecting streets (Campbell and Collins Streets) or in places where reasonable residential amenity is unachievable because of existing traffic or environmental impacts. These commercial uses must not themselves diminish the amenity of or the potential for adjacent*

residential development.

- *To encourage frontages of commercial activity only on the ground floor of buildings abutting streets.*
- *To encourage commercial activity in existing buildings where this is required to assist in their conservation.*
- *To encourage a mix of uses on the sites in the west and north-west of the Activity Area and fronting Campbell Street.*

6.7.5 While the discretionary component of the proposed use, the 1000 seat conference hall, forms a smaller percentage of the overall proposal, it is housed within the overall building being proposed. Therefore, both the function centre use and the proposed building that houses it must be assessed against the objectives listed above.

As the proposal includes no residential component, it does not further the objectives that relate to the provision of housing. If forming part of a different, future planning application with a built form and operating parameters that were consistent with all relevant provisions of the planning scheme, it is possible that 'function centre' as a use may be considered appropriate in the Activity Area.

As the proposal seeks to demolish all existing buildings on the site, no retention or restoration of buildings is intended, albeit that the existing buildings are not individually listed for cultural significance.

The mass and facade of the proposed building does not appropriately relate to the space that it forms. While at ground level the building provides glazing and some openings, and commercial activities encouraged by one of the objectives, above ground level the podium element of the building rises sharply above the street, albeit with some interest provided in the variable shape of the proposed awning on Collins Street.

The proposed building is clearly modern in its approach, however it is not evident that the design incorporates any relevant interpretation of the history of the area, nor does it appear to incorporate any historic cues. The use of sandstone facing throughout the podium level as a more traditional material is noted.

While the proposal is a substantial commercial use, that use is by no means justified, as the sheer scale of the building it is housed within and its location relative to neighbouring properties would dwarf adjacent residential development, diminishing existing and potential future

residential amenity through unreasonable overshadowing and visual obtrusion. It is considered that reasonable residential amenity for both occupants and neighbours of the subject site could be achieved with an alternative development proposal.

The proposed use does therefore not meet or sufficiently further the Objectives of the Activity Area that are relevant to the subject site. In accordance with the conditions of clause 15.3.4, the use is therefore considered to be prohibited.

6.7.6 The proposal does not comply with the performance criterion (Objectives of the Activity Area).

6.8 Schedule 1 - Conservation of Cultural Heritage Values – Heritage - (Adjacent) – 22.5.5

6.8.1 The acceptable solution at clause 22.5.4 states that 'Building or works' on other land within the planning area is 'permitted' in respect to this Schedule where it can be demonstrated that the following 'deemed to comply' standards can be met:
For 'building or works' on sites adjacent (as defined in clause 22.3) to a place of cultural significance:

- The height of 'building or works' adjacent to places of cultural significance must not exceed that of any building on the place, at a distance of less than 10 (horizontal) metres from the building; and
- The area of the facade of any new 'building or works' must not exceed that of the facade of an adjacent place of cultural significance by a factor of 2.

6.8.2 The proposal does not satisfy the 'deemed to comply' standards of clause 22.5.4.

6.8.3 The proposal does not comply with the 'deemed to comply' standards; therefore assessment against the performance criterion is relied on.

6.8.4 The performance criterion at clause 22.5.5 provides as follows:

'Building or works' on land which cannot satisfy the 'deemed to comply' provisions of Clause 22.5.4 may be approved at the discretion of the Planning Authority. The following criteria must be taken into consideration in the assessment of all proposals for 'building or works':

- *'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public space, or be more prominent in the street than the adjacent place of cultural significance.*
- *The area of a facade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity.*
- *'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.*
- *The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.*
- *'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.*

6.8.5 The Council's Senior Cultural Heritage Officer provides the following assessment of the proposal:

The subject site is adjacent to two places of cultural significance listed within Table 1 of Schedule 1 of the Sullivans Cove Planning Scheme 1997. 'Place' is defined as the site, area, building or work, group of buildings or works with associated contents and surroundings. The only building or works that are 'permitted' adjacent to places of cultural significance must comply with the following standards:

• The height of 'building or works' adjacent to places of cultural significance must not exceed that of any building on the place, at a distance of less than 10 (horizontal) metres from the building; and

• The area of the façade of any new 'building or works' must not exceed that of the façade of an adjacent place of cultural significance by a factor of 2.

The proposal falls well outside the scope of 'permitted' status and must therefore be assessed against the provisions of clause 22.5.5 of the scheme. Among the mandatory tests within that clause are the following:

• 'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public

space, or be more prominent in the street than the adjacent place of cultural significance.

• The area of a façade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity.

• 'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.

• The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.

• 'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.

The adjacent listed place in Brooker Avenue is approximately 6 metres high, rising to 8 metres at the apex of the sawtooth roof form. The podium of the proposed hotel is approximately 2.5 times higher than the highest part of the adjacent wall, and the height of the overall building (55.1m) is more than 6 times the height of the adjacent wall. The applicant acknowledges that the proposal will "alter the scale of buildings" within the Cove and will appear as a "landmark within the streetscape".

By virtue of the height of the proposed hotel structure, the proposal will clearly dominate adjacent places of cultural significance when viewed from the street and other public spaces, and will be more prominent in the street than the adjacent places of cultural significance.

The area of the façade of the proposed new building will radically exceed that of the adjacent places of cultural significance. Any objective assessment would suggest that the visual impact of the apparent disparity of scale is significant. There is no historic precedent to warrant such scale disparity.

The proposal fails to complement and contribute to the specific character and appearance of adjacent places of cultural significance in any way – nor to the historic character of the Cove generally. The

Resource Management and Planning Tribunal (James Richard Gandy v Hobart City Council & Tasmanian Heritage Council [2016] TASRMPAT 36 (21 November 2016)) has provided the following interpretation in relation to the terms 'complement' and 'contribute':

To complement and contribute, requires that the works must confer a state of completeness (or wholeness) upon the building and bring something to the cultural significance, character and appearance of it, within its setting.

The Tribunal uses the notion of "completeness" as a concept synonymous with "complement", to convey the idea that the works will make whole or complete the place. … The idea of doing that work to bring balance back to the overall structure sits with the concept of complementing and contributing to the cultural significance, character and appearance of the place because it restores a part of it.

The location, bulk and appearance of the proposed building will adversely affect the heritage values of adjacent and nearby places of cultural significance, by creating an incongruous backdrop fundamentally out of scale with the present visual setting of these structures.

The 'permitted' height for the site of 15 metres suggests a much lower building than that proposed, and any building which complied with this height standard would also be likely to avoid being so prominent.

6.8.6 The proposal does not comply with the performance criterion.

6.9 Schedule 1 - Conservation of Cultural Heritage Values - Archaeology – clause 22.6.5

6.9.1 The acceptable solution at clause 22.6.4 states that works which constitute the excavation of land on any place of cultural significance (as identified in Table 1), including those identified in Table 2, are 'permitted' where a statement is provided by a qualified archaeologist that either the site has been surveyed previously and found not to be of archaeological significance or that the nature of the 'building or works' will not result in destruction of any aspects of items of archaeological significance.

6.9.2 The proposal includes disturbance, including partial excavation of a site listed in Table 2 of Schedule 1 as a Place of Archaeological Sensitivity.

A Statement of Archaeological Potential and an Archaeological Impact Assessment and Method Statement have been submitted with the application, and it has been determined that the proposal is likely to have an impact on significant archaeological remains.

6.9.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.9.4 The performance criterion at clause 22.6.5 provides as follows:

Having regard to the contents and recommendations of an Archaeological Sensitivity Report accepted by the Planning Authority pursuant to Clause 22.6.3 the following criteria must be taken into consideration in the assessment of all proposals to develop places of cultural significance listed in Table 2 or that are considered likely to be of archaeological interest or significance:

- *The likelihood of the proposed 'building or works' resulting in the removal or destruction of items of archaeological significance.*
- *The cultural significance of the site.*
- *Evidence of an adequate archaeological reconnaissance and site sampling prior to the approval or carrying out of works.*
- *The need to reasonably protect potential archaeological significance during the design, and carrying out of works.*
- *The need to undertake an archaeological 'watching brief' to be required during the carrying out of works.*

6.9.5 The Council's Senior Cultural Heritage Officer provides the following assessment of the proposal:

The subject site is also a 'Place of Archaeological Sensitivity' and both a Statement of Archaeological Potential and an Archaeological Impact Assessment and Method Statement have been provided. The studies identify zones of high archaeological sensitivity and state that "the proposed development is expected to have impact upon significant archaeological remains in approximately 20 locations across the site. The report suggests that "it is not considered feasible to retain any of these archaeological features in-situ." The proposal will result in a significant loss (about 20%) of archaeological resource across the site.

The overall objectives of Schedule 1 – Conservation of Cultural Heritage Values include such statements as:

- *to ensure that the recognisable historic character of Sullivans Cove is not compromised by new development which overwhelms the places of cultural significance and*

- *to encourage new development to be recognisable as new, but not individually prominent. Such development must reflect a "good neighbour relationship to places of identified cultural value.*

There are examples of new buildings within Sullivans Cove that adopt a 'good neighbourly' approach. Such buildings invariably reflect the predominant scale of the historic port and Wapping area, rather than the scale of more intrusive buildings.

6.9.6 The proposal does not comply with the performance criterion.

6.10 Urban Form (Building Form) – clause 23.6.2

6.10.1 The acceptable solution at clause 23.6.1A requires new buildings to demonstrate that 'deemed to comply' provisions for Height; Alignment (Primary Space); Alignment (Secondary Space); Plot Ratio; Apparent Size and Urban Gardens have been satisfied.

Deemed to Comply Provisions

Height - 15m

Alignment (Primary Spaces) - Buildings must be built to the street line of all primary street frontages, with walls located on the front property boundary and extending across no less than 90% of the primary street frontage.
Where a new building is located on a corner with two primary street frontages, this requirement must be satisfied for each frontage.
New buildings must not step back adjacent to a Primary Space. The only permissible exceptions to this is in situations where the stepping back is less than 1:20 relative to the height of the wall on the property boundary and where there is a wall to the boundary at least 12m high.

Alignment (Secondary Spaces) - Where applicable, buildings must also be built to, or align with, the secondary street frontage.

Plot Ratio - 3.0

Apparent Size - The length of buildings in street edge elevation must not

be more than twice the width of the abutting street.

Urban Gardens - Where the construction of a building results in the creation of secondary spaces with public access. These spaces must be fenced at street frontage, landscaped and include facilities for pedestrians as appropriate, such as seating.

6.10.2 The proposal would have a height of 55.1m.

The subject site fronts two primary spaces, however the proposed building is only built to the street line (and partially beyond with regard to the Collins Street awning) for the podium section of the first to fourth floor levels, with the ground level facade set inwards some 4-4.2m from the Collins Street boundary and 3.6m from the Brooker Avenue boundary. The levels above the podium exhibit a much greater setback, particularly from the Collins Street frontage.

There are no secondary spaces adjacent to the site.

The plot ratio of the proposed building is 8.1.

The building occupies the majority of the length of both street frontages, particularly for levels 1 through 4. There is a small discrepancy in the overall width of the ground floor level due to it being set in from the street frontage, with the initial upper levels overhanging. The Highway Reservation of the abutting streets varies in its width, with Brooker Avenue ranging from 30m to 26m, and Collins Street ranging from 51m to 20m. If taking an average between each figure, the proposed building does not exceed twice the width of Brooker Avenue, whilst it exceeds twice the width of the Collins Street reservation by approximately 3.5m. The wide expanse of the Collins Street Highway Reservation where it meets Brooker Avenue benefits the proposal in this regard.

No secondary spaces with public access are created as part of the proposal.

6.10.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.10.4 The performance criterion at clause 23.6.2 provides as follows:

Development which cannot satisfy the 'deemed to comply' provisions' of Clause 23.6.1 may be approved at the discretion of the Planning

Authority taking into consideration the Objectives in Clause 23.2. Such development includes:

- *Any new buildings or works adjacent to a Place of Cultural Significance and which are not more prominent in the streetscape by strong contrast of scale, height, colour and tone with the buildings constructed on the place, and, which are not detailed in a manner which is similar to buildings of cultural significance or which adopts an "historic" appearance.*
- *Works undertaken in accordance with a Conservation Plan approved by the Planning Authority where required and/or provided.*

The Objectives regarding Urban Form at Clause 23.2 state:

The following objectives apply to the application of this Schedule:

- *The traditional urban pattern of Sullivans Cove is to be conserved. A contemporary adaptation is to be created in development/redevelopment areas.*
- *Views to Sullivans Cove along primary spaces are to be retained, especially to the River Derwent.*
- *Views over the land bounded by Tasman Highway, Brooker Avenue and Liverpool Street from the City and Wapping to the Domain and from the Domain and Tasman Highway to the City are to be retained.*
- *Expression of the Wall of the Cove is to be encouraged where possible.*
- *The bulk and height of buildings must reflect the natural topography of the Sullivans Cove Planning Area, the amphitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.*
- *A diversity of building heights and volumes will be encouraged within this over-riding pattern, but buildings must have a respectful relationship to each other and to buildings of identified cultural significance within a street.*
- *New buildings must not be individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.*
- *New buildings should facilitate the creation of 'secondary spaces' on lots in the Cove. Such spaces should be encouraged where they demonstrably create useable pedestrian environments and facilitate pedestrian movement and views.*
- *New urban gardens are to be encouraged in secondary spaces*

only.

- *On the land bounded by the Tasman Highway, Brooker Avenue and Liverpool Street the landscaping should reflect the variety of garden areas and parkland styles that exist in the immediate surrounding area and that mark the transition to the Domain.*

6.10.5 Amongst other things, the urban form objectives require the traditional urban pattern of the Cove to be conserved, buildings to have a respectful relationship to each other and to buildings of identified cultural significance, and buildings not being individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.
The proposed development is more than 3.5 times the 'deemed to comply' building height, and 2.7 times the 'deemed to comply' plot ratio. For reference, the main roof of the existing, taller part of The Old Woolstore Apartment Hotel has a maximum height of approximately 21m, with the lower sawtooth section being approximately 15m tall. The Hotel Grand Chancellor has a maximum height of approximately 46m. The round building immediately opposite on Collins Street has a maximum height of 23m. The University's 'Hedberg' development currently under construction further to the south-west on the Collins/Campbell Street corner is approved at 33m. Further afield, and subject to a different planning scheme, is the Royal Hobart Hospital being redeveloped to a maximum height of 69m, which includes its helipad.

There are no buildings of similar size or bulk in the immediately adjacent blocks or in this defined entrance way to the Sullivans Cove area to the north-east and east of Campbell Street, and there is relative separation between what are the larger buildings in the immediate area. This is not a situation where the proposed building would fill a gap in a block of taller city buildings, for instance. The incongruous nature of the height, scale and bulk of the proposed new building will be obvious in Collins Street, Brooker Avenue and from a number of other public areas, including the grounds near the Cenotaph.

The over-arching principles of the Sullivans Cove Strategic Framework (within clauses 5, 6 and 7 of the Scheme) also provide general guidance on the nature of new development, responding to the quality of spaces and buildings in the Cove, with future development respecting the scale and general character of the Cove. Clause 7.3.2 reiterates the principle of no new development being individually prominent.

'Prominence' is a concept which features in the provisions of both

Schedule 1 – Conservation of Cultural Heritage Values and Schedule 2 – Urban Form. The Macquarie Dictionary defines 'prominent' as: standing out so as to be easily seen; conspicuous; very noticeable. The Resource Management and Planning Appeal Tribunal (James Richard Gandy v Hobart City Council & Tasmanian Heritage Council [2016] TASRMPAT 36 (21 November 2016)) considered the question of 'prominence' in relation to the corresponding criterion of clause 22.4.5:

The Tribunal considers that this Criterion does not introduce a subjective element, but rather is a purely objective test. It manifests an intention that new work should be identifiable as such and that it should not be particularly noticeable. Whether it is particularly noticeable is not a question which can be answered by a subjective assessment: the question is not "is that which is installed acceptable". New works which are individually prominent or particularly noticeable are not permitted by the Scheme. This interpretation is consistent with the Tribunal's comments that the threshold for compliance with Criterion 1 with its terms is very high - to the extent that the Scheme intends that there should be little or no new development within the Cove.

Any objective assessment of the proposal must inevitably lead to the conclusion that the proposed building will be higher, bigger and more prominent in the streetscape and townscape generally than neighbouring buildings. The proposal does not meet the discretionary provisions of clause 23.6.2, as it will be more prominent in the streetscape than adjacent Places of Cultural Significance, by strong contrast of scale, height, colour and tone.

Of note here also are the principles of Schedule 5 - Traffic, Access and Parking of the *Sullivans Cove Planning Scheme 1997*, as they relate to urban form. The proposal includes three levels of car parking, above ground within the podium section of the building on levels two, three and four. Schedule 5 states that car parking provided for facilities in the Cove is likely to be detrimental to the Cove's urban character and heritage. Consequently, in general, car parking will not be required to be provided on-site for any use or development. In the Inner City Residential (Wapping) Activity Area 1.0, Traffic, Access and Parking standards only apply to the area covered by the Wapping Local Area Plan, which does not include and therefore does not apply to the subject site. Schedule 5 clause 26.1 goes on to state that:

Any development involving the provision of on site car parking will have to demonstrate that the impact of that provision - either physically or

operationally will not adversely impact on the character and heritage values of the Cove, on pedestrian movement and amenity.

Perhaps more critically, under the principles of Schedule 5 at clause 26.2:

Unless particularly specified as a policy objective or requirement for all or part of an Activity Area, or approved as part of the guidelines for the redevelopment of a Key Site, developments will not be expected to incorporate on-site vehicle parking and it will only be approved to the extent that the car parking does not direct the design of the development and does not have a detrimental effect on the form and character of Sullivans Cove or on its pedestrian amenity and activity. Any development necessitating an exercise of discretion under the Scheme in relation to height to facilitate the provision of on site parking would not be considered to be in keeping with the planning principles for the Cove (emphasis added).

6.10.6 The proposal does not comply with the performance criterion.

6.11 Urban Form (Building Surfaces) – clause 23.7.2

6.11.1 The acceptable solution at clause 23.7.1 requires development to comply with several 'deemed to comply' provisions, which include:

Building Facade to a Primary Space - Surfaces must be primarily masonry; A maximum allowable void of 50 percent is permissible in all street frontage elevations; Surfaces of facades to primary space must comprise high quality finishes that reinforce the status as a primary building frontage.

Building Facade to a Secondary Space - Surface must be finished so as to be presented in a less detailed and ornate manner than the surface of the building to a primary space, or the surfaces of adjacent buildings to primary spaces.

Night-Lighting - Must accentuate the wall of the building when illuminated, and where appropriate also highlight the landscaping.

Building Surfaces to Brooker Avenue and Tasman Highway in Activity Area 2.0 - Surfaces should contribute to buildings having a minimal visual presence through materials which provide a complex patterning; Surfaces must comprise high quality materials and finishes suitable for viewing as part of the ‘gateway’ into the Cove.

Surfaces adjacent to nectar bearing native flora (Tasmanian and exotic eucalyptus, etc) - The configuration of buildings and any adjacent nectar bearing native flora must be designed to prevent bird collisions caused by the reflection of such vegetation or sky in glazing and/or unobstructed views through a surface to an outdoor space. Glazing must be consistent with the DPIWE Threatened Species Unit publication "Prevent window collisions: Save our native birds", or achieve comparable performance.

6.11.2 The proposal includes a combination of external finishes, including Alucabond or similar spec. cladding; powder coated steel perforated mesh; Alucabond or similar spec. louvers; off form concrete panels; curtain wall glazing; glazing suites. The proposal states that night lighting will be incorporated to accentuate the walls of the building when illuminated, and where appropriate highlight the landscaping. The site is not located in Activity Area 2.0. Whilst there is no evidence provided as to how this will be achieved, the proposal states that
The configuration of buildings and any adjacent nectar bearing native flora will be designed to prevent bird collisions caused by the reflection of such vegetation or sky in glazing and/or unobstructed views through a surface to an outdoor space. Glazing must be consistent with the DPIWE Threatened Species Unit publication "Prevent window collisions: Save our native birds", or achieve comparable performance.

6.11.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.11.4 The performance criterion at clause 23.7.2 provides as follows:

Development which cannot satisfy the 'deemed to comply' provisions of Clause 23.7.1 may be approved at the discretion of the Planning Authority.

The objectives of this Schedule must be taken into consideration in the assessment of all 'discretionary' development.

The Objectives regarding Urban Form at Clause 23.2 state:

The following objectives apply to the application of this Schedule:

- *The traditional urban pattern of Sullivans Cove is to be conserved. A contemporary adaptation is to be created in development/redevelopment areas.*

- *Views to Sullivans Cove along primary spaces are to be retained, especially to the River Derwent.*
- *Views over the land bounded by Tasman Highway, Brooker Avenue and Liverpool Street from the City and Wapping to the Domain and from the Domain and Tasman Highway to the City are to be retained.*
- *Expression of the Wall of the Cove is to be encouraged where possible.*
- *The bulk and height of buildings must reflect the natural topography of the Sullivans Cove Planning Area, the amphitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.*
- *A diversity of building heights and volumes will be encouraged within this over-riding pattern, but buildings must have a respectful relationship to each other and to buildings of identified cultural significance within a street.*
- *New buildings must not be individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.*
- *New buildings should facilitate the creation of 'secondary spaces' on lots in the Cove. Such spaces should be encouraged where they demonstrably create useable pedestrian environments and facilitate pedestrian movement and views.*
- *New urban gardens are to be encouraged in secondary spaces only.*
- *On the land bounded by the Tasman Highway, Brooker Avenue and Liverpool Street the landscaping should reflect the variety of garden areas and parkland styles that exist in the immediate surrounding area and that mark the transition to the Domain.*

6.11.5 The proposed building does not meet the 'permitted' provisions of clause 23.7.1, which requires the surface of the building façade to be primarily masonry, with a maximum allowable void of 50 percent. The proposal incorporates Alucobond®, powder coated steel perforated mesh, off form concrete panels, curtain wall glazing, glazing suites and sandstone facing. The proposal must therefore be assessed against the objectives of clause 23.2. As stated previously, these objectives require the traditional urban pattern of the Cove to be conserved, buildings to have a respectful relationship to each other and to buildings of identified cultural significance. The proposed building materials and surface finishes do not have a respectful relationship with established nearby buildings. The majority of the exterior of the proposed tower will comprise curtain wall glass construction, which by any objective assessment is at the other end

of the scale from construction which is 'primarily masonry' as the planning scheme expects.

6.11.6 The proposal does not comply with the performance criterion.

6.12 Public Urban Space (Building or Works) – clause 24.4.6

6.12.1 The acceptable solution at clause 24.4.5 (and clause 24.4.2) requires all minor road works to be carried out in accordance with the Footpath and Road Median Material Types plan shown in Figure 9b of the *Sullivans Cove Planning Scheme 1997*, or any Civic Works & Public Street Furniture Concept Plan incorporated as part of this Scheme, or:

(a) no trees are required to be removed to facilitate the buildings or works;
(b) there is no material alteration to the road or footpath alignment, configuration or profile;
(c) there is no material change to the finished surface materials.
Otherwise such works are discretionary.

6.12.2 The proposal includes an awning partially protruding into the airspace above the Collins Street Highway Reservation, removal and realignment of existing kerbs to alter the current on street car parking arrangement and road width on Collins Street adjacent to the site; removal of an existing street tree to allow for the proposed vehicle entry/exit point to function alterations to the existing footpath width and removal and relocation of existing bollards on Ragged Lane. For the most part, these works are considered to be 'Minor Road Works' classified as

6.12.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.12.4 The performance criterion at clause 24.4.6 provides as follows:

All buildings or works nominated in the table to Clause 24.4.2 as 'D' (Discretionary) require a permit, except where the site is within the area identified by Figure 9a, the building or works are 'permitted'. The Planning Authority may exercise its discretion to approve, approve with conditions, or refuse any application. In considering such applications, the Planning Authority must satisfy itself that the proposed buildings or works are compatible with the following:

- *The 'Civic Works and Public Street Furniture' Guidelines outlined in*

Clause 24.4.8.

- *The function of the Public Urban Space as described in Clause 24.4.10.*
- *The provisions of clause 24.4.9 apply where appropriate.*

6.12.5 On a technical basis, the proposed revisions to the pavement, on-street parking and kerb alignment, as well as the removal of the street tree have been accepted in principle by the technical officers tasked with their assessment, who will ensure that such works are carried out appropriately in accordance with Council standards. No public street furniture is proposed and as such the standards governing such things are not relevant to this proposal.

Of note are comments provided by the Council's Open Space and Reserves Officers regarding the proposal removal of the street tree, who state:

> *Council's arborist has assessed the tree to be removed and determined an amenity value of $57,331.15. There would also be a cost for a replacement tree. She also identified that the plans indicate that the awning along the Collins [Street] façade would jut out into the canopy of the trees to be retained along that street, damaging the trees. Could the design be altered to protect the street trees to be retained? And we notice that the street trees are not shown on several of the artist's impressions of the new building. Need to confirm that all the other trees would be retained, undamaged.*

Conditions addressing the payment of the amenity value of the tree to remove it, payment of a replacement cost, preparation of a tree protection plan for the trees to be retained and preparation of an environmental management plan for the removal of the tree have been recommended for any planning permit issued by the Council. Additional technical conditions to manage the alterations to the pavement, kerb and on-street parking areas would also be included on any permit granted for the proposal.

6.12.6 The proposal complies with the performance criterion subject to conditions.

6.13 Demolition – clause 28.6

6.13.1 There is no acceptable solution for demolition within the Cove under clause 28.3.1. All such demolition is 'discretionary'.

6.13.2 The proposal includes demolition of all existing buildings upon the site.

6.13.3 There is no acceptable solution; therefore assessment against the performance criterion is relied on.

6.13.4 The performance criterion, or in this case 'Guidelines for Development Control' at clause 28.5 provides as follows:

The demolition of any building, or works on land shall not be 'permitted' unless; a replacement development has been approved, or such demolition is required by statutory order or is authorised by the Building Surveyor as essential to public safety
Any application for demolition:
(a) Shall be refused if the building is included as a cultural heritage place in Table 1 of the Conservation of Cultural Heritage Values Schedule of this Scheme, unless;
(i) The demolition is approved as part of a Conservation Plan approved by the Planning Authority or otherwise in its discretion under the Conservation of Cultural Heritage Values Schedule of this Scheme;
(ii) The building clearly detracts from the cultural values or significance of the place; or
(iii) There are overriding environmental, economic considerations in terms of the building or practical considerations for its removal, either wholly or in part.
(b) May be refused if in the opinion of the Planning Authority the building contributes to the cultural heritage or urban character of the Activity Area and the building is capable of continued beneficial use.

Additionally, matters to be considered for demolition under clause 28.6 include:

In considering any proposal for demolition, the Planning Authority shall give regard to the following matters:

- *The impact of the proposed demolition on the character of the Activity Area;*
- *The impact of the proposed demolition on the cultural heritage values of the Cove;*
- *The need to avoid creation of vacant sites and 'lost space' in the Cove.*

Further, the Objectives of Schedule 7 at clause 28.2 state:

The protection and promotion of the Cultural Heritage and Urban Character of the Cove is of primary concern in the consideration of proposals to demolish the built fabric of the Cove.

6.13.5 The proposal involves demolition of the Roberts building on the corner of Collins Street and Brooker Avenue. The proposal also involves the demolition of the former Council garage (c.1925) – a building which is still used for vehicle parking, and survives reasonably intact albeit with two external walls removed. The building façade to Collins Street contributes to the urban character of Collins Street and the area generally. The proposal does not meet the provisions of clause 28.5 and clause 28.6 of the Sullivans Cove Planning Scheme 1997, as it involves the demolition of a building which (a) contributes to the urban character of the Activity Area, and (b) is capable of continued beneficial use. The proposed demolition will have a detrimental impact on the character of the Activity Area.

6.13.6 The proposal does not comply with the performance criterion.

7. Discussion

7.1 Planning approval is sought for Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities at 2 Collins Street and adjacent road reserve, Hobart.

7.2 The application was advertised and received Fourteen-hundred and Fifty-nine (1459) representations, of which three were in favour. The representations raised concerns including excessive height, inappropriate design, non-compliance with relevant scheme standards, impacts upon surrounding amenity, cultural heritage and the Hobart landscape, the building being out of character with the city and not being compatible with the scale and charm of the place.

7.3 The proposal has been assessed against the relevant provisions of the *Sullivans Cove Planning Scheme 1997*, and while it is noted that the height of the building was reduced from what was originally proposed, the revised height of 55.1 metres now proposed is still considered to be significantly beyond the scope and intent of relevant planning scheme standards and objectives. Implications within documentation forming part of the application that these provisions are outdated are not supported. Although the planning scheme clearly had its genesis some years ago, it has been subject to numerous revisions and amendments over its lifespan. It is not a static document, and with regard to provisions around height, there is nothing to suggest that the Scheme is out of step with current community thinking, particularly when it comes to protecting the character of Sullivans Cove. It is suggested that community consultation conducted as part of the City of Hobart's Vision engagement and the City's recently commissioned height reviews support this proposition.

7.4 In relation to the proposed use of the building, there is reference within the submitted documentation to the proposed conference facility being reliant upon the number of rooms proposed, and by inference, the scale of the building. While it is accepted that conference facilities require accommodation for delegates to stay in, it is suggested that such accommodation does not necessarily need to be located on-site for a conference facility to be viable. Therefore, while it may be important for the proponent to offer a certain number of rooms to ensure the financial viability of the proposal, and while Hobart may be in need of additional conference facilities, the notion that the number of rooms proposed, and therefore the height and scale of the building, is justified by the proposed conference facility is not supported by the planning scheme.

7.5 The *Sullivans Cove Planning Scheme 1997* includes the ability to apply discretion where appropriate, and where the objectives and strategic framework of the scheme can still be achieved. This proposal, however, is considered inconsistent with planning scheme provisions relating to height, plot ratio, heritage, archaeology, demolition, use and parking. The development is more than 3.5 times the acceptable height for the area, and is significantly above the acceptable density. It represents a significantly larger building than those around it. It is unavoidably individually prominent, which is a key scheme consideration. Furthermore, the proposal includes multiple levels of above ground car parking, where the scheme specifically discourages such car parking that exacerbates the height of proposed development. The proposal is inconsistent with the *Sullivans Cove Planning Scheme 1997,* and does not warrant the exercising of discretion sought by the application.

7.6 The proposal has been assessed by other Council officers, including the Council's Development Engineer, Stormwater, Road and Traffic Engineers, Cleansing and Solid Waste Services Officers, Open Space and Recreation Officers, Environmental Health Officers, Surveying Services Officers, Cultural Heritage Officer, and City Design Officers. Some of these officers have raised objection to the proposal, while others have recommended conditions in the event of any approval issued by the Council.

7.7 Given the height of the proposed development, the application was considered by the Council's Urban Design Advisory Panel (UDAP). The Panel met and discussed the proposal with the applicants at the UDAP meeting of 12 September 2018. Although only having an advisory capacity, the Panel formed the following views in relation to the proposal:

(i) The proposal does not meet the requirements of the Sullivans Cove Planning Scheme 1997, particularly taking into account, the proposed height and form of the development and consideration of the Objectives of Schedules 1 and 2 of the Planning Scheme.

(ii) The case as to why the specific attributes of this Proposal (eg overall height and the podium design and its interface with the street) would support the substantial departure in the planning scheme provisions has not been made.

(iii) The case has not been made as to why this proposal justifies a fundamental shift in the built scale of the City and the Panel has significant concerns as to the precedent the proposal may have as a result. The proposal and specifically with regard to the proposed height, is not supported by the most recent work undertaken by Urban Design Architect Leigh Woolley which suggests a maximum height of 21 metres in this area. The current deemed to comply height within the Scheme is 15 metres.

It is also noted that (extract from the officer report)… 'principles of Schedule 5 highlight that developments will not be expected to incorporate on-site vehicle parking and it will only be approved to the extent that the car parking does not direct the design of the development and does not have a detrimental effect on the form and character of Sullivans Cove.'

7.8 The proposal is recommended for refusal.

8. Conclusion

8.1 The proposed Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities at 2 Collins Street and Adjacent Road Reserve, HOBART does not satisfy the relevant provisions of the *Sullivans Cove Planning Scheme 1997*, and as such is recommended for refusal.

9. Recommendations

That: Pursuant to the *Sullivans Cove Planning Scheme 1997*, the Council refuse the application for Demolition and New Development for Visitor Accommodation, Function Centre and Associated Facilities at 2 Collins Street and Adjacent Road Reserve, HOBART for the following reasons:

1 The proposed function centre does not meet the Objectives of Clause 15.2 of the *Sullivans Cove Planning Scheme 1997*, as it:

a) fails to ensure that the building masses and facades appropriately relate to the spaces they form.

b) fails to ensure that the proposed non-residential use is based on the amenity and characteristics of specific sites.

c) fails to ensure that the amenity of or the potential for adjacent residential development will not be diminished.

and is therefore considered to be prohibited under clause 15.3.4 of the *Sullivans Cove Planning Scheme 1997.*

2 The proposal does not meet the performance standards of clause 22.5.5 of the *Sullivans Cove Planning Scheme 1997*, as:

(a) it will dominate adjacent places of cultural significance when viewed from the street or any other public space, and will be more prominent in the street than the adjacent places of cultural significance contrary to the Cultural Resource Principles (Cultural Heritage and Urban Character) of the *Sullivans Cove Planning Scheme 1997* espoused in clause 7.3.2.

(b) the area of the facade of the new building will exceed that of the buildings on adjacent places of cultural significance and the visual impact of the apparent disparity of scale is significant and historic precedent does not warrant the scale disparity.

(c) the proposal fails to complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.

(d) the location, bulk and appearance of the proposed building will adversely affect the heritage values of adjacent and nearby places of cultural significance, by creating an incongruous backdrop out of scale with the present visual setting.

3 The proposal exceeds the 'deemed to comply' height, alignment, plot ratio, apparent size and building surfaces standards of clause 23.6.1A and 23.7.1 of the *Sullivans Cove Planning Scheme 1997* and in turn fails to meet the objectives of clause 23.2, in that:

a) it fails to conserve the traditional urban pattern of the Cove

b) its bulk and height does not reflect the natural topography of the Sullivans Cove Planning Area, the ampitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.

b) it does not promote a respectful relationship between buildings and to buildings of identified cultural significance within a street.

c) the building will be individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.

d) the building does not facilitate the creation of 'secondary spaces' on lots in the Cove.

4 The proposal exceeds the maximum 'permitted' height standards and exceeds the standards for apparent size of clause 23.6.1A of the *Sullivans Cove Planning Scheme 1997* and does not meet the corresponding discretionary provisions of clause 23.6.2, as it will be more prominent in the streetscape than adjacent Places of Cultural Significance, by strong contrast of scale, height, colour and tone.

5 The proposal does not meet the provisions of clause 28.5 and clause 28.6 of the *Sullivans Cove Planning Scheme 1997*, as it involves the demolition of a building which (a) contributes to the urban character of the Activity Area, and (b) is capable of continued beneficial use. The proposed demolition will have a detrimental impact on the character of the Activity Area.

(Cameron Sherriff)
Development Appraisal Planner

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Rohan Probert)
Manager Development Appraisal

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 31 December 2018

Attachment(s):

Attachment B - CPC Agenda Documents

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-16-1133		Council notice date	26/10/2016
TasWater details				
TasWater Reference No.	TWDA 2016/01594-HCC		Date of response	1/09/2017
TasWater Contact	David Boyle	Phone No.	6345 6323	
Response issued to				
Council name	HOBART CITY COUNCIL			
Contact details	coh@hobartcity.com.au			
Development details				
Address	2-6 COLLINS ST, HOBART		Property ID (PID)	5660219
Description of development	Proposed Hotel Development			

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
S. Group	J002192 A01-A201		21/10/2016
Gandy & Roberts Consulting Engineering	16.0253 C001, C010, & C012	B	16/08/2017

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water property connection(s) must be provided to service the domestic and fire demands of the proposed development in accordance with TasWater standards and any other conditions in this permit.

   ***Advice**: TasWater modelling indicates that the requested flows can be supplied at the required pressures in the DN200 main at the proposed connection point and does not take into account losses through the connection or through internal pipework. Flows will need to be controlled so as not to exceed the maximum figures requested in the application.*

   It should also be noted TasWater will not accept direct fire boosting from the network unless it can be demonstrated that the periodic testing of the system will not have a significant negative effect on our network and the minimum service requirements of other customers serviced by the network. To this end break tanks may be required with the rate of flow into the break tank controlled so that peak flows to fill the tank do not also cause negative effect on the network.

2. A suitably sized sewer property connection must be provided to service the sewerage demands of the proposed development and must discharge directly into a TasWater sewer manhole in accordance with TasWater standards and any other conditions in this permit.

   ***Advice**: The local sewer reticulation system can surcharge to surface in wet weather and the developer should ensure that internal plumbing is designed to avoid problems from backflow of sewage from the reticulation system overflowing into their basement or ground floor.*

3. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.

BOUNDARY TRAP AREA

4. The proposed development is within a boundary trap area and the developer must provide a boundary trap that prevents noxious gases or persistent odours back venting into the property's sanitary drain. The boundary trap must be contained within the property boundaries and the property owner remains responsible for the ownership, operation and maintenance of the boundary trap.

TRADE WASTE

5. Prior to the commencement of operation the developer/property owner must obtain Consent to discharge Trade Waste from TasWater.
6. The developer must install appropriately sized and suitable pre-treatment devices prior to gaining Consent to discharge.
7. The Developer/property owner must comply with all TasWater conditions prescribed in the Trade Waste Consent.

DEVELOPMENT ASSESSMENT FEES

8. The applicant or landowner as the case may be, must pay a development assessment fee to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date they are paid to TasWater, as follows:

   a. $1,114.71 for development assessment;

   The payment is required within 30 days of the issue of an invoice by TasWater.

Advice

General

For information on TasWater development standards, please visit http://www.taswater.com.au/Development/Development-Standards

For application forms please visit http://www.taswater.com.au/Development/Forms

The developer is responsible for arranging to locate existing TasWater infrastructure and clearly showing it on any drawings. Existing TasWater infrastructure may be located by TasWater (call 136 992) on site at the developer's cost, alternatively a surveyor and/or a private contractor may be engaged at the developers cost to locate the infrastructure.

TRADE WASTE

Prior to any Building and/or Plumbing work being undertaken, the applicant will need to make an application to TasWater for a Certificate for Certifiable Work (Building and/or Plumbing). The Certificate for Certifiable Work (Building and/or Plumbing) must accompany all documentation submitted to Council. Documentation must include a floor and site plan with:

1. Location of all pre-treatment devices i.e. grease arrestor;
2. Schematic drawings and specification (including the size and type) of any proposed pre-treatment device and drainage design; and
3. Location of an accessible sampling point in accordance with the TasWater Trade Waste Flow Meter and Sampling Specifications for sampling discharge.
4. Details of the proposed use of the premises, including the types of food that will be prepared and

served; and

5. The estimated number of patrons and/or meals on a daily basis.

At the time of submitting the Certificate for Certifiable Work (Building and/or Plumbing) a Trade Waste Application form is also required.

If the nature of the business changes or the business is sold, TasWater is required to be informed in order to review the pre-treatment assessment.

The application forms are available at http://www.taswater.com.au/Customers/Liquid-Trade-waste/Commercial.

Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

Authorised by

Jason Taylor
Development Assessment Manager

TasWater Contact Details			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

City of HOBART

EB:SJB
F18/33665

17 April 2018

MEMORANDUM: GENERAL MANAGER

REQUEST TO GRANT LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**2 Collins Street, Hobart**
Description of Proposal:	**Removal of existing street tree in Collins Street Highway Reservation** **Relocation of bollards in Ragged Lane Highway Reservation** **Relocation of kerb line in Collins Street Highway Reservation** **Awning over footpath in Collins Street Highway Reservation** **Changes to parking in Collins Street Highway Reservation** **Removal and replacement of two street lights in Collins Street Highway Reservation**
Applicant Name:	**Jonathan Buist - S Group**
PLN *(if applicable)*:	**PLN-16-1133**

Land owner consent for the proposed development was granted on 23 May 2017. However, due to the new design of the building including reduction in height it has been advised by the Manager Development Appraisal and Manager Development Compliance that given that the application has substantially changed the previous land owner consent does not apply to the amended plans.

The proposal for works within the Highway Reservation have not changed substantially apart from the removal of louvres on the building over the Highway Reservation.

The proposed development within the Collins Street and Ragged Lane Highway Reservations in which landlord consent is recommended and shown on the attached plan are:

1. Removal of existing street tree in Collins Street Highway Reservation

   The Manager Parks and Recreation has previously advised that the removal of the tree outside the proposed driveway is supported. The Director Parks and City Amenity has previously verbally advised that a replacement tree would be required and consideration given to seeking compensation. It has been noted on the plan that approval is required before the tree is removed and consideration given to a replacement tree and/or compensation.

2. Relocation of bollards in Ragged Lane Highway Reservation

   The relocation of the bollards in Ragged Lane to cater for the changes in kerb line is supported. The final position will be determined in accordance with City of Hobart requirements.

3. Relocation of kerb line in Collins Street Highway Reservation

   The relocation of the kerb and associated infrastructure is supported in-principle. The final design will need to be submitted for approval by the Director City Infrastructure. The provision of a minimum footpath width of 2 metres is to be achieved within the Highway Reservation at the proposed vehicle entrance and is noted on the plans.

4. Awning over footpath in Collins Street Highway Reservation

   The proposed awning, being 6 metres above the Highway Reservation is supported and will be conditioned for accordingly within the planning permit.

5. Changes to parking in Collins Street Highway Reservation

   The changes to parking being two parking drop off spaces and bus layby, were previously supported by the Manager Traffic Engineering.

6. Removal and replacement of two street lights in Collins Street Highway Reservation

   The removal of two street lights currently mounted on the existing building and their replacement is supported in-principle. The new lights will need to be installed in accordance with City of Hobart requirements.

The development is supported in principle by the Manager Road and Environmental Engineering for the planning application to be lodged.

RECOMMENDATION

That pursuant to Section 52 of the Land Use Planning and Approvals Act 1993, the General Manager grant consent on behalf of the Hobart City Council as the owner/administrator of the above land to allow the applicant to make application to the City for a planning permit for the development described above and as per the attached documents.

(John Holmes)
MANAGER ROAD AND ENVIRONMENTAL ENGINEERING

ENDORSED:

17/4

(Mark Painter)
DIRECTOR CITY INFRASTRUCTURE

~~**Approved / Not Approved**~~
Endorsed

18/4/2018

(Glenn Doyle)
DIRECTOR PARKS AND CITY AMENITY

Approved / ~~**Not Approved**~~

(Heather Salisbury)
ACTING GENERAL MANAGER

Date: 19/4/2018

Attachments/Plans: Request for landlord consent from S Group architects on behalf of applicant – letter dated 11 April 2018

Site Plan A102 by S Group

City of HOBART

Enquiries to: Emily Burch
☎: 6238 2108
✉: coh@hobartcity.com.au
Our Ref: 5660219P (F18/32715)
F18/33665

17 April 2018

Mr Jonathan Buist
Project Architect
S Group
PO Box 1271
LAUNCESTON TAS 7250

Via Email: jono@sgroup.com.au

Dear Mr Buist

NOTICE OF LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**2 Collins Street, Hobart**
Description of Proposal:	**Removal of existing street tree in Collins Street Highway Reservation** **Relocation of bollards in Ragged Lane Highway Reservation** **Relocation of kerb line in Collins Street Highway Reservation** **Awning over footpath in Collins Street Highway Reservation** **Changes to parking in Collins Street Highway Reservation** **Removal and replacement of two street lights in Collins Street Highway Reservation**
Applicant Name:	**Jonathan Buist - S Group**
PLN *(if applicable)*:	**PLN-16-1133**

I write to advise that pursuant to Section 52 of the *Land Use Planning and Approvals Act 1993*, I grant my consent on behalf of the Hobart City Council as the owner/administrator of the above land for you to make application to the City for a planning permit for the development described above and as per the attached documents.

Please note that the granting of the consent is only for the making of the application and in no way should such consent be seen as prejudicing any decision the Council is required to make as the statutory planning authority or as the owner/administrator of the land.

Yours faithfully

(Heather Salisbury)
ACTING GENERAL MANAGER

Attachment: Land Owner Consent

City of HOBART

LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**2 Collins Street, Hobart**
Description of Proposal:	**Removal of existing street tree in Collins Street Highway Reservation** **Relocation of bollards in Ragged Lane Highway Reservation** **Relocation of kerb line in Collins Street Highway Reservation** **Awning over footpath in Collins Street Highway Reservation** **Changes to parking in Collins Street Highway Reservation** **Removal and replacement of two street lights in Collins Street Highway Reservation**
Applicant Name:	**Jonathan Buist - S Group**
PLN *(if applicable)*:	**PLN-16-1133**

The land indicated above is owned or is administered by the Hobart City Council.

The applicant proposes to lodge an application for a permit, pursuant to the *Land Use Planning and Approvals Act 1993,* in respect to the proposal described above.

Part or all of the application proposes use and/or development on land owned or administered by the City located at Collins Street and Ragged Lane Highway Reservation (as shown on the attached plans).

Being and as General Manager of the Hobart City Council, I provide written permission to the making of the application pursuant to Section 52(1B)(b) of the *Land Use Planning and Approvals Act 1993.*

(Heather Salisbury)
ACTING GENERAL MANAGER

Date: 18/4/2018

City of HOBART

17 April 2018

MEMORANDUM: **LORD MAYOR**
DEPUTY LORD MAYOR
ALDERMEN

GENERAL MANAGER CONSENT TO LODGE A PLANNING APPLICATION - SECTION 52(1B)(b) OF LUPAA

Site Address:	**2 Collins Street, Hobart**
Description of Proposal:	**Removal of existing street tree in Collins Street Highway Reservation** **Relocation of bollards in Ragged Lane Highway Reservation** **Relocation of kerb line in Collins Street Highway Reservation** **Awning over footpath in Collins Street Highway Reservation** **Changes to parking in Collins Street Highway Reservation** **Removal and replacement of two street lights in Collins Street Highway Reservation**
Applicant Name:	**Jonathan Buist - S Group**
PLN *(if applicable)*:	**PLN-16-1133**

Pursuant to Section 52(1B)(b) of the *Land Use Planning and Approvals Act 1993*, the General Manager may provide written permission to allow the submission of a planning application involving Council-owned/administered land.

Following a request from the above applicant, I have provided consent for the lodgement of a planning application.

The applicant has been advised that the granting of the consent is only for the making of the application and in no way should the consent be seen as prejudicing any decision the Council is required to make as the statutory planning authority or as the owner/administrator of the land.

As the planning application proceeds through the statutory process, statutory public advertising may be required.

(Heather Salisbury)
ACTING GENERAL MANAGER

11th April 2018

Hobart City Council

Elizabeth Street, Hobart

Re: 2-6 Collins Street - Request for landlord consent for work on and over the Collins Street / Brooker Ave / Ragged Lane road reserves, Hobart.

Ref. document S Group - Site Plan A02 DA-V2 09/04/2018 REV B

The following items are raised for landlord consent;

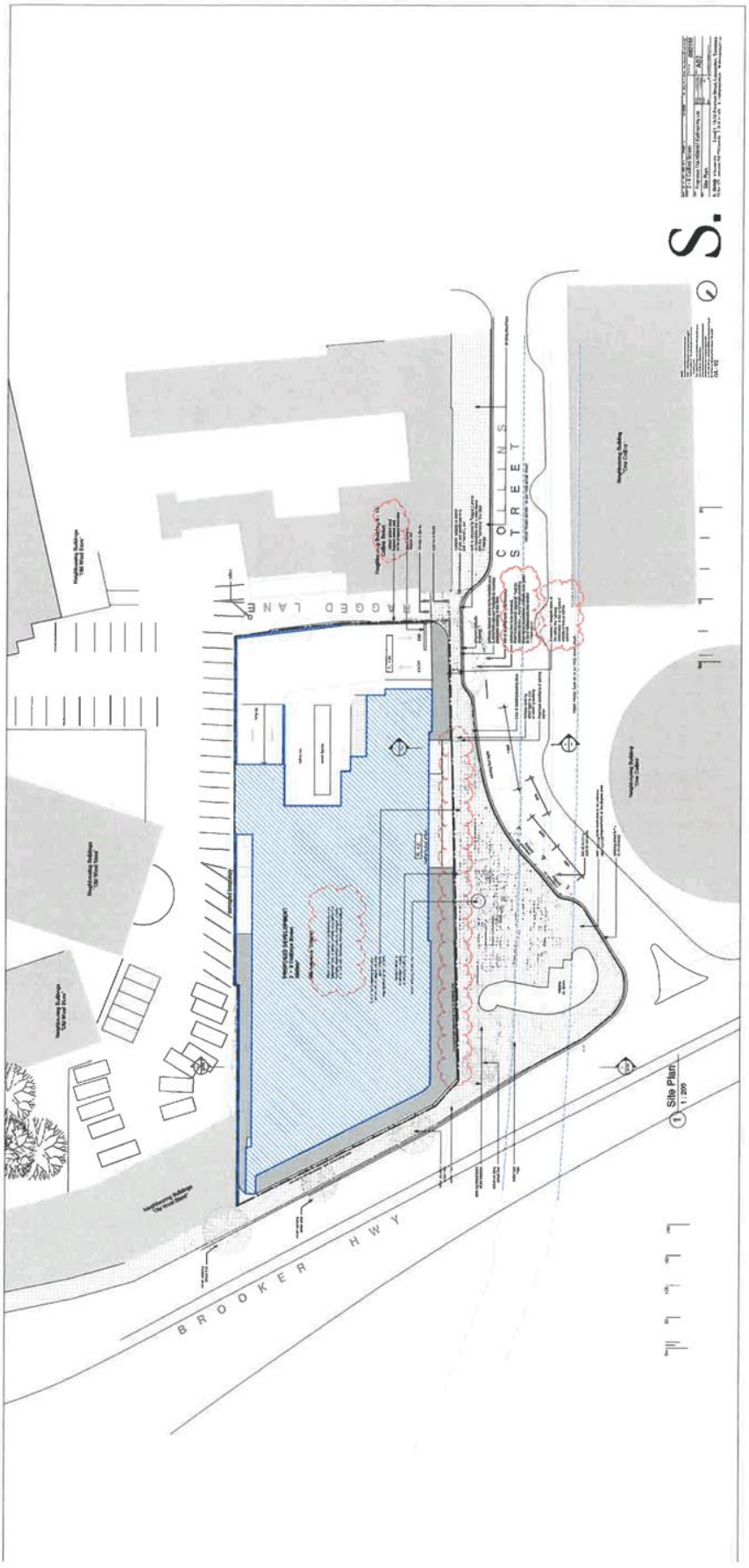
1. Removal of existing street tree to provide safe vehicle access into on site parking with-in the hotel complex
2. Relocation of existing bollards South along Ragged lane on advice of HCC
3. Adjust existing line of kerb for new cross over into proposed hotel driveway
4. Protrusion of proposed entry awning over road reserve (min. clearance of 6.0 mtrs, max. protrusion of 1.6mtrs) This will provide visitor shelter between title boundary and drop off / parking point in Collins Street.
5. Extension of existing loading zone by 2 carspaces, towards Brooker Ave. This will provide opportunity safe disembarking from vehicles
6. Installation of 2 new street lamps into the road reserve to replace existing street lights on 2-6 Collins St. This would be undertaken at the developers cost.

Yours Sincerely,

Jonathan Buist, *Project Architect*

Chase. Wonder.

t. 03 6311 1403 w. www.sgroup.com.au e. info@sgroup.com.au abn. 86996265268


COLLINS STREET
BROOKER HWY
Site Plan
1 : 200

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
121603	1
EDITION	DATE OF ISSUE
4	20-Jul-2016

SEARCH DATE : 24-Oct-2016
SEARCH TIME : 01.06 PM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Sealed Plan 121603
Derivation : For Grantees see plan
Prior CTs 64636/2, 249136/1, 121603/1000 and 33036/1

SCHEDULE 1

D139491 TRANSFER to FRAGRANCE TAS-HOBART (COLLINS) PTY LTD
Registered 20-Jul-2016 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP121603 EASEMENTS in Schedule of Easements
SP121603 COVENANTS in Schedule of Easements
SP121603 FENCING PROVISION in Schedule of Easements

UNREGISTERED DEALINGS AND NOTATIONS

127430 PLAN Lodged by H.E.C. on 05-Sep-1997 BP: 127430

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

OWNER Roberts Limited

FOLIO REFERENCE C.T.64636-2, C.T. 33036-1 C.T. 249136-1, C.T.121603-1000

GRANTEE Whole of 0A 1R 3P, Gtd to R.A.Roberts, Part of 0A 2R 5P, Gtd to George & Margaret Scrimgeour, Whole of 0A 0R 5¼P, Gtd to Jane Scrimger, Whole of Lot 2 0A 0R 11¾lo & Lot 3 0A 0R 17¼lo, Gtd to Henry Martin, Part of Lot 1, Gtd to Patrick Martin, Part of Lot 4, Granted to Samuel Wells Roberts, Part of 0A 2R 2P, Gtd to Joshua Fergusson, Part of 0A 1R 20P, Granted to Mary Facy, Part of allotment vested in the City Council

PLAN OF SURVEY

BY SURVEYOR A.M.Peacock of PEACOCK, DARCEY & ANDERSON P/L AUTHORISED SURVEYORS

LOCATION 127 BATHURST STREET-HOBART

CITY OF HOBART

SCALE 1: 500 LENGTHS IN METRES

Registered Number SP121603

APPROVED EFFECTIVE FROM 20 NOV 1995

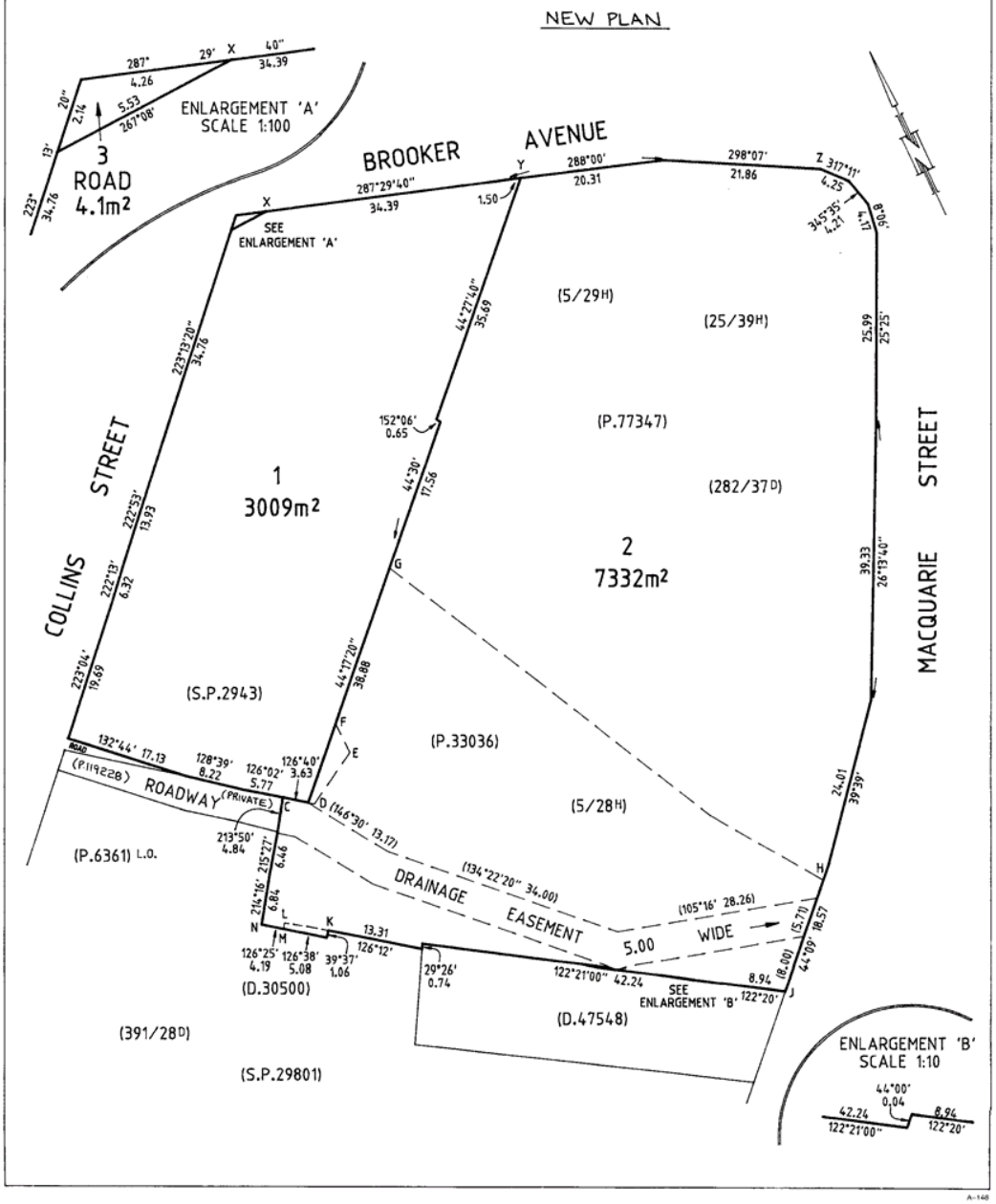
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 114

LAST UPI No. 2100060, 2100061 2100062

LAST PLAN No. P249136 SP2943, P33036

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN



SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SCHEDULE OF EASEMENTS

NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.

REGISTERED NUMBER

SP 121603

EASEMENTS AND PROFITS

PAGE 1 OF 3 PAGES

Each lot on the plan is together with:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
(2) any easements or profits a prendre described hereunder.
Each lot on the plan is subject to:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
(2) any easements or profits a prendre described hereunder.
The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

That portion of lot 2 on the plan marked C D E F G H J K L M N which formerly comprised part of folio of the Register Volume 33036 Folio 1 is together with a free and uninterrupted right of carriage and driftway in through and over the roadway or passage marked "Roadway" (Private) on the Plan.

Lot 2 on the plan is:-

Subject to a right of drainage (for the Hobart City Council) over the strip of land marked "Drainage Easement 5.00 wide" passing through such lot and as shown on the plan.

SUBDIVIDER : ROBERTS LIMITED

FOLIO REF : C.T 64636-2 C.T 33036-1 C.T 249136-1 CONV 28/852

SOLICITOR & REFERENCE : PAGE SEAGER

PLAN SEALED BY : THE HOBART CITY COUNCIL

DATE : 31 OCTOBER 1995

404.5 REF No.

General Manager SURVEYING SERVICES

NOTE: THE COUNCIL GENERAL MANAGER MUST SIGN THE CERTIFICATE FOR THE PURPOSE OF IDENTIFICATION.

SCHEDULE OF EASEMENTS PAGE 2 OF 3 PAGES	Registered Number SP121603

Fencing Provision:-

In respect of each lot shown on the plan the Vendor (Roberts Limited) shall not be required to fence.

Covenants:-

The owner of ~~each~~ lots 1 and 2 shown on the plan covenants with the Vendor (Roberts Limited) and the owners for the time being of ~~each~~ every other lot shown on the plan to the intent that the burden of this covenant may run with and bind the covenantors lot and every part thereof and that the benefit thereof shall be annexed to and devolve with each and every part of every other lot shown on the plan to observe the following stipulations:-

1. Not to construct nor permit to be constructed or used any vehicular access to Brooker Highway between the points marked XY and YZ shown on the plan.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SCHEDULE OF EASEMENTS PAGE 3 OF 3 PAGES	Registered Number SP121603

THE COMMON SEAL of ROBERTS)
LIMITED (ACN 009 475 647) was)
hereunto affixed in the presence of:)

ROBERTS LIMITED THE COMMON SEAL ACN 009 475 647

Director: ....

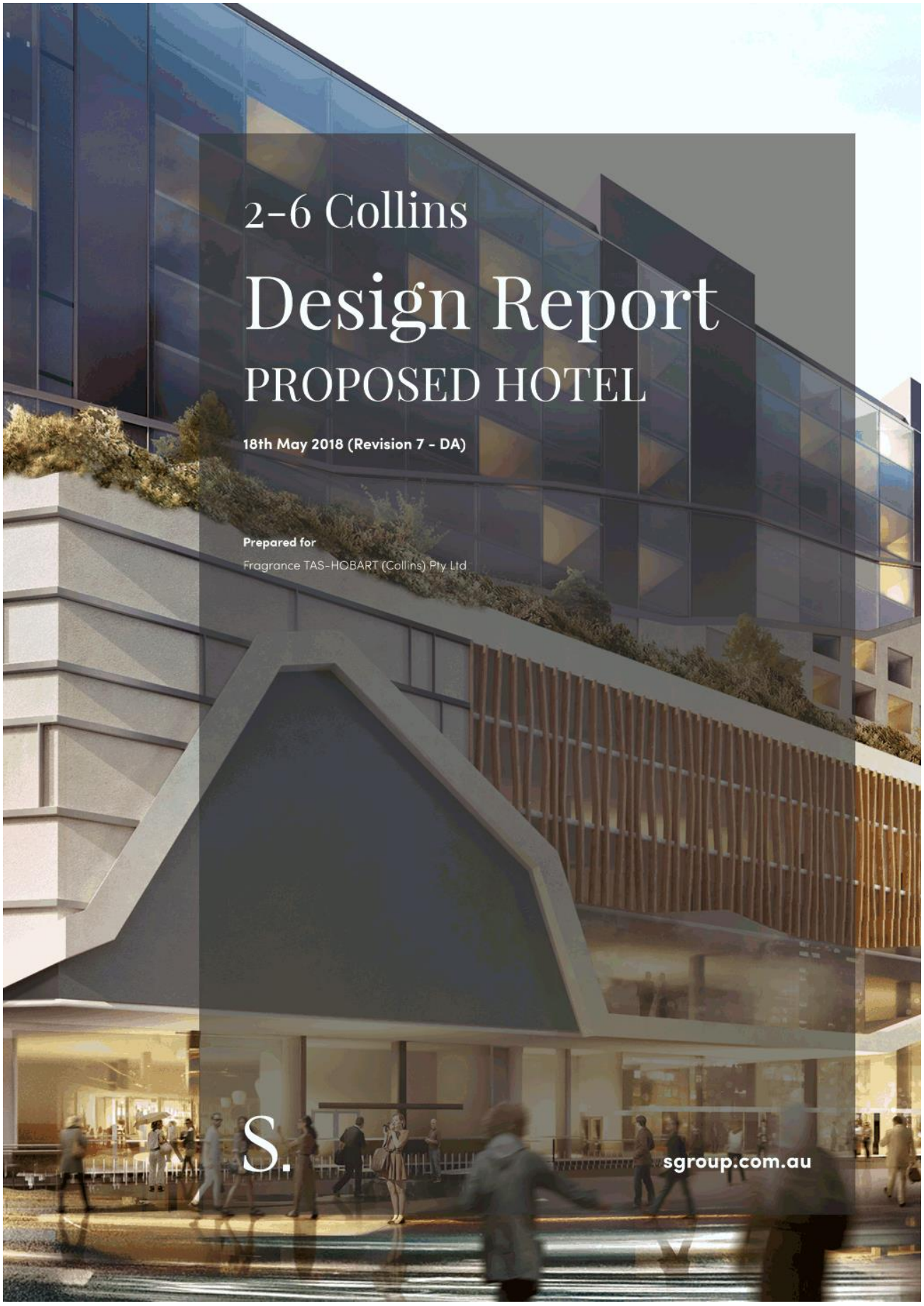
~~Director~~/Secretary ....

AUSTRALIA AND NEW ZEALAND)
BANKING GROUP LIMITED as)
Mortgagee of the land described in)
Folios of the Register Volume 33036)
Folio 1 Volume 64636 Folio 2 and)
Volume 249136 Folio 1 by virtue of a)
Mortgage Registered No. A962258 and)
as Mortgagee of the land described in)
an Indenture of Conveyance Registered)
No. 28/0852 by virtue of an Indenture)
of Mortgage Registered No. 60/7958)
hereby consents to this Schedule of)
Easements)

AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED by
is signed, in the presence of:
Bank Officer, Hobart.

AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED

MANAGER


2-6 Collins
Design Report
PROPOSED HOTEL
18th May 2018 (Revision 7 - DA)
Prepared for
Fragrance TAS-HOBART (Collins) Pty Ltd
S.
sgroup.com.au

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Site, Architect, Developer	4
Consultant Reports & Associated Reports	5
Design Philosophy, Economic Benefit, Sustainability	6
Project Scale, Conference & Coaches	7
Built Form & Context	8
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Executive Summary

The proposal is to offer a 4-star hotel facility, complemented by a large conference facility and associated commercial operations.

— 256 room hotel with a combination of suites, 2 bed and 3 bed rooms
— hotel lobby, restaurant, café, commercial space and associated facilities
— 1000 seat conference room with associated breakout spaces and catering
— 167 car spaces and full size coach parking
— wellness centre and spa, swimming pool, gym and club house

Nominal Construction Budget	$55M
Program Pending Approvals	Late 2018 Construction Commencement

Key Benefits

Conference Facility

The proposal includes a 1000 seat conference room with associated facilities. It is noted that the critical mass of the hotel is directly related to the conference facility, allowing Hobart to host large national and international conferences as a destination.

256 Hotel Rooms

Recent studies have shown Hobart is in clear need of hotel rooms. The scale of this proposal provides a large indentation in the demand.

Activation - lower Collins St

Inclusion of conference facilities and hotel will bring activation to the lower end of Collins St with significant numbers of staying guests and the hosting of major events. A hotel restaurant, separately tenanted cafe and retail shop will lead to increased pedestrian traffic and further activation.

Site

Located at the northern end of Collins Street, 2-6 Collins Street offers the city a unique opportunity – not only to activate the somewhat quiescent precinct, but to offer a stepping stone and potential gateway to the future development at Macquarie Point.

In recent years, the site has been home to Roberts, and currently is used as storage and car parking. It is proposed that all existing development on the site is to be demolished in readiness for the proposed works.

Architect

A unique multi-disciplinary studio integrating architecture and strategic creative design. S. Group are leaders in offering a combination of specialist knowledge, resources, capability and scale, driven by an ultimate vision to enhance our communities both on a local and global scale through interactions with progressive, functional, and beautifully considered design. Listed on the BRW top 100 new companies alongside winning a number of other accolades in recent years, the team are truly thrilled to work collaboratively with the developer, council and community to achieve a respectful, sustainable and progressive outcome for the city.

Developer

Fragrance Group is an established developer having successfully completed more than 100 developments comprising hotel, residential and commercial / industrial buildings in Singapore. The Group has been active in Australia since 2014 and has major developments in Melbourne and Perth, as well as Hobart. Respectful to the physical and economic cityscape of Hobart, Fragrance Group are excited to work alongside the council and community to achieve a positive lasting impact.

Consultant Reports & Associated Documents

The following drawings, documents and reports for the Development Application:

Design Report	S. Group
Architectural Drawings	S. Group
Shadow Diagrams	S. Group in association with HCC K2Vi Model
Context Massing Diagrams	S. Group in association with HCC K2Vi Model

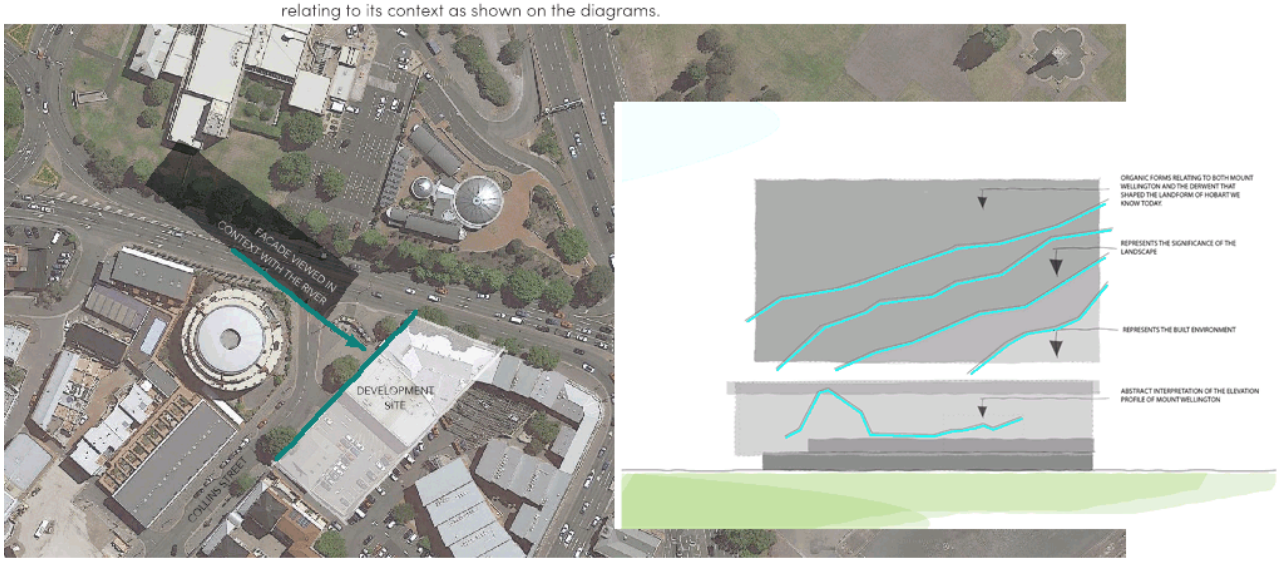
Statutory Planning	Pitt & Sherry
Traffic Impact Assessment	Pitt & Sherry
Heritage and Archaeology	Praxis Environment
Structural Specification	Gandy & Roberts
Hydraulics and Civil	Gandy & Roberts
Land Survey	Rogerson & Birch
Flood Risk Assessment	Entura Hydro Tasmania
Environmental Site Assessment	Geo-Environmental Solutions

Design Philosophy

The proposed architecture has been highly philosophically considered, taking cues from not only the directly adjacent history, but also that of the city of Hobart itself.

The proposed development challenges a number of points in the planning scheme. However, we believe the proposal to be highly contemplated, not only in form, but in the story the architecture tells from its place, and the level of complementary community benefits apparent.

The form of the building takes cues from the surrounding landscape context with each opposing façade relating to its context as shown on the diagrams.



Economic Benefit

It is clear that the proposal offers significant economic benefit to both the Hobart and Tasmanian economies. It is noted that the developer has a number of other projects of similar scales in Hobart, which will provide a substantial positive impact for the local economy.

Sustainability

The project's focus on sustainability is not only on an environmental level, but also incorporating social and cultural sustainability on a number of platforms. The architecture of the project will look to incorporate energy efficient lighting and equipment, along with consideration of materials embodied energy, ensuring both initial and ongoing environmental benefits.

Additionally, social and cultural sustainability are key drivers by offering the potential for the site to be a strategic linkage point. It will connect to the city via Collins Street, to Macquarie Point.

Project Scale

The scale of the project is co-dependent on a number of key development components. The scale of the conference facility, which allows the project to become a national conference destination, relies on the number of hotel rooms. This quantity of hotel rooms is also necessary to attract large premium international hotel operators to enter the Hobart market The size of the hotel also supports substantial commercial operation on the ground floor, encouraging permeability and activation of the end of Collins Street. Further the quantity of hotel rooms, being 4 star and diverse in size (studio, 2/3 bedroom) ensure a broad demographic of users, and maintain viability for facilities, such as a full floor wellness centre.

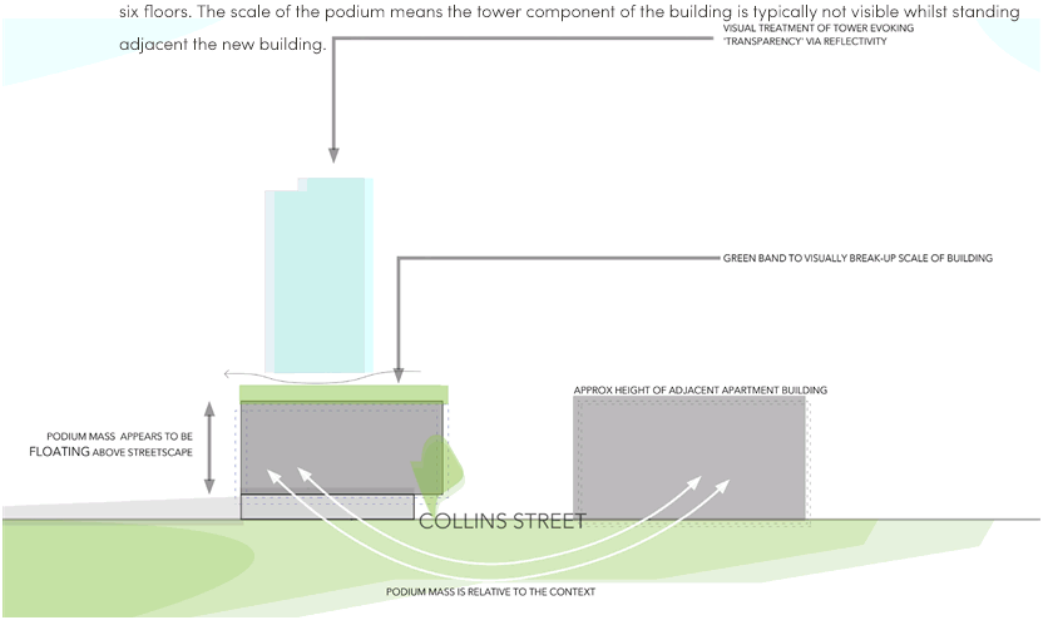
Conference & Coaches

The proposed 1000 seat conference facility is a unique offering for Hobart and could see the city become a national destination further adding significant economic benefit. Through consultation of Tasmanian coach operators, it is evident that there is a lack of quality accommodation with suitable parking. The proposal includes full size coach parking on site, allowing the hotel to be accessible to large tour groups.

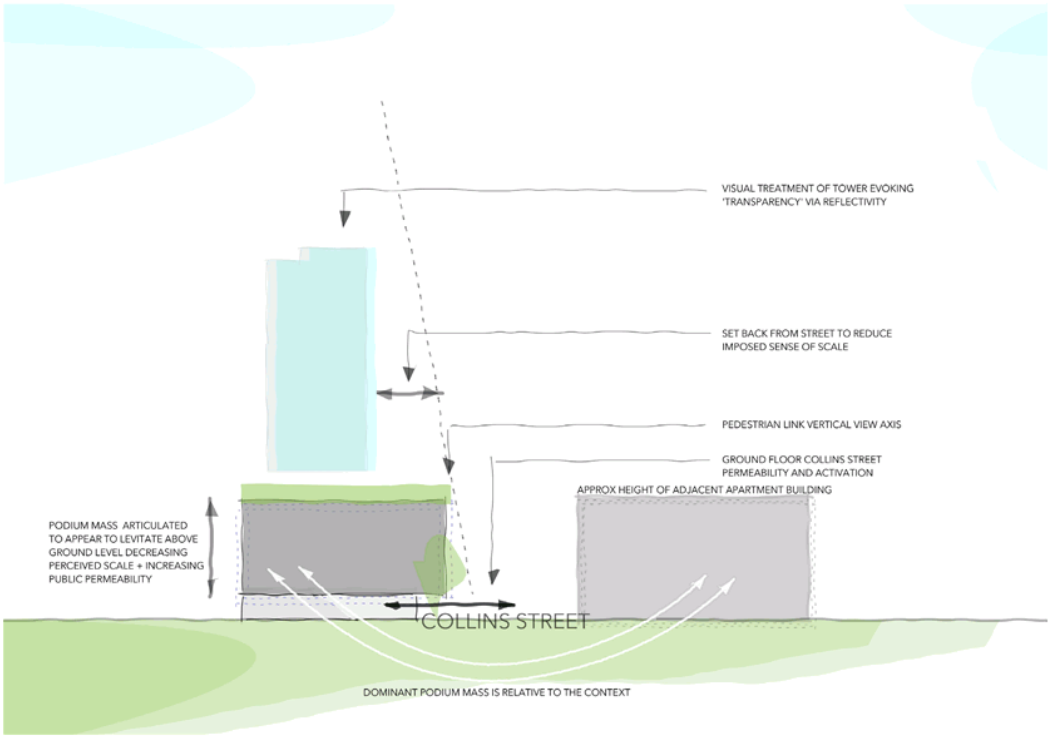
Built Form & Context

The building is comprised of two components, the first being the podium of five stories being a nominal 20 metres in height and includes capacity for 167 car spaces and a 1000 seat auditorium. The second component, the tower, takes the building to a total of 15 floors and a nominal 51.6 metres of height. Note: this excludes rooftop plant and overrunning structure.

The proposal is broken down into two components, ensuring the buildings mass and façade relate to the adjacent spaces/street. The podium being five floors in height is proportional to the adjacent apartment building consisting of six floors. The scale of the podium means the tower component of the building is typically not visible whilst standing adjacent the new building.



The two components of the development (podium and tower) assist in minimising the apparent scale of the build. The proposed façade has been articulated in such a fashion as to break down the inherent horizontal scale through the use form, cladding, materiality and tone. The podium is elevated at street level to maximise connection between the interior and exterior. This also gives the perception that the podium is lighter in structure, reducing the bulk heaviness that would otherwise be perceived from a building form that brings solid perimeter walls right down to ground level.



Urban Activation

The ground floor of the proposed development allows legible and permeable commercial use, being a hotel lobby, food premises and further commercial spaces available for approved use. This, in association with the potential for a pedestrian and bicycle link to Macquarie Point, encourage activation of the site as a key link.

S.

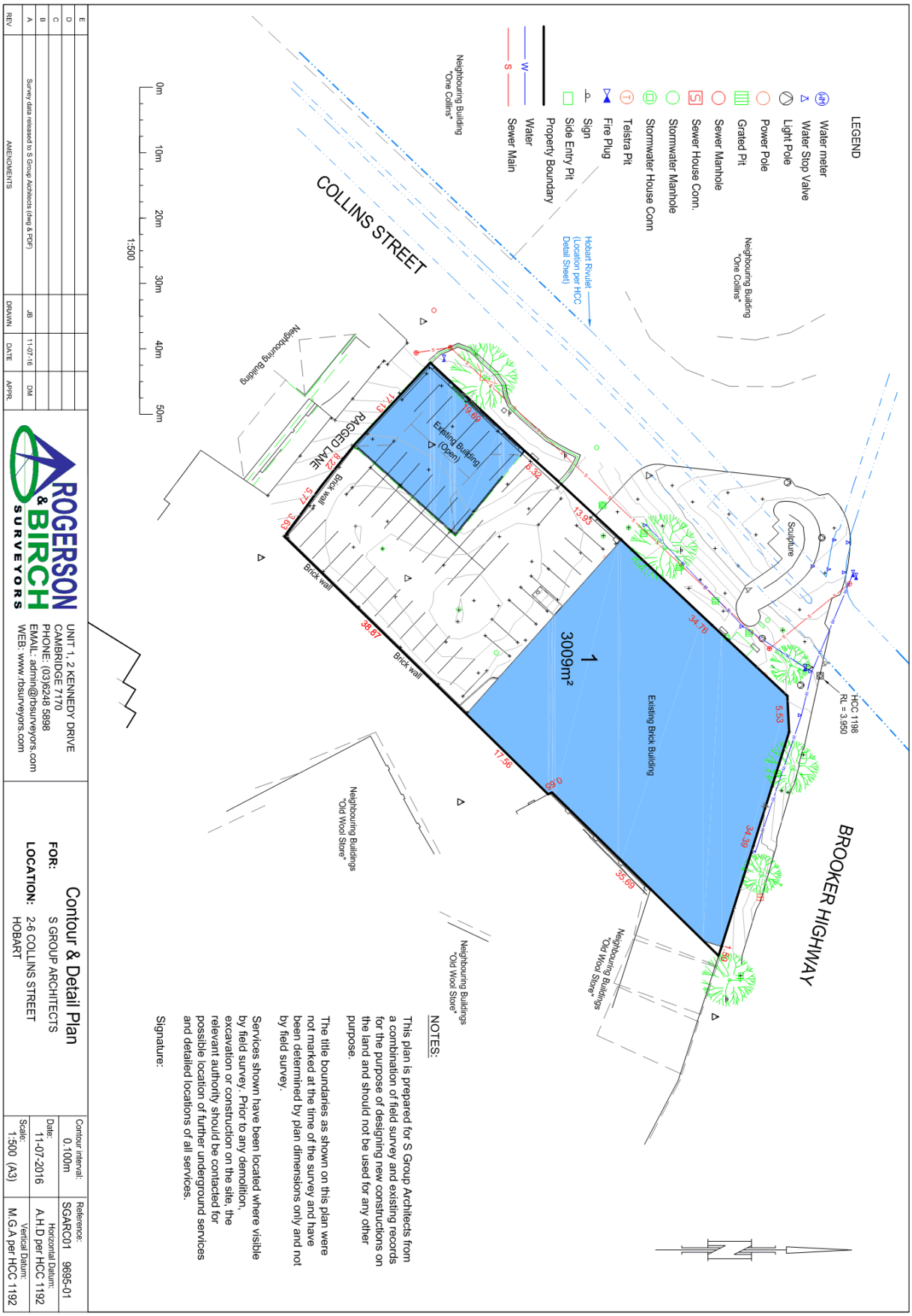
City Mill, 11 Morrison Street,
Hobart Tasmania 7000
t. 03 6251 3906

Level 1, 10-14 Paterson Street
PO Box 1271 v Tasmania 7250
t. 03 6311 1403

w. www.sgroup.com.au
f. sgroupdesign

Your contact at S. Group
Jonathan Buist - Senior Architect

*** note all images and diagrams in this report are either artists impressions or not to scale schematic diagrams*



NOTES:

This plan is prepared for S Group Architects from a combination of field survey and existing records for the purpose of designing new constructions on the land and should not be used for any other purpose.

The title boundaries as shown on this plan were not marked at the time of the survey and have been determined by plan dimensions only and not by field survey.

Services shown have been located where visible by field survey. Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

Signature:

REV	AMENDMENTS	DRAWN	DATE	APPR.
E				
D				
C				
B				
A	Survey data released to S Group Architects (dwg & PDF)	JB	11-07-16	DM

ROGERSON & BIRCH SURVEYORS
UNIT 1, 2 KENNEDY DRIVE
CAMBRIDGE 7170
PHONE: (03)6248 5898
EMAIL: admin@rbsurveyors.com
WEB: www.rbsurveyors.com

Contour & Detail Plan

FOR: S GROUP ARCHITECTS

LOCATION: 2-6 COLLINS STREET HOBART

Contour interval:	0.100m
Date:	11-07-2016
Scale:	1:500 (A3)
Reference:	SGARC01 9695-01
Horizontal Datum:	A.H.D per HCC 1192
Vertical Datum:	M.G.A per HCC 1192

Report to Support a Development Application 2 - 6 Collins Street, Hobart

transport | community | mining | industrial | food & beverage | carbon & energy



Prepared for:	Fragrance TAS-HOBART (Collins) Pty Ltd
Client representative:	Adrian Lim
Date:	18 June 2018 Rev04

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Prepared by: ..... Ian Abernethy Date: 18 June 2018

Reviewed by: ..... Andy Turner Date: 18 June 2018

Authorised by: ..... Andy Turner Date: 18 June 2018

Revision History					
Rev No.	**Description**	**Prepared by**	**Reviewed by**	**Authorised by**	**Date**
A	Client for comments	I. Abernethy	N/A	A. Turner	09/09/2016
B	Revision	L. Knight	N/A	A. Turner	19/10/2016
C	Change in Plans	I. Abernethy	N/A	A. Turner	06/02/2017
D	Change of Plans	I. Abernethy	N/A	A. Turner	22/01/2018
03	Version to client	I. Abernethy	N/A	A. Turner	29/05/2018
04	Version to client	I. Abernethy	N/A	A. Turner	18/06/2018

1. Introduction

This is a report to support a development application to demolish a current office/storage type building and replace it with a hotel and conference centre facility.

Figure 1 - Current development on site

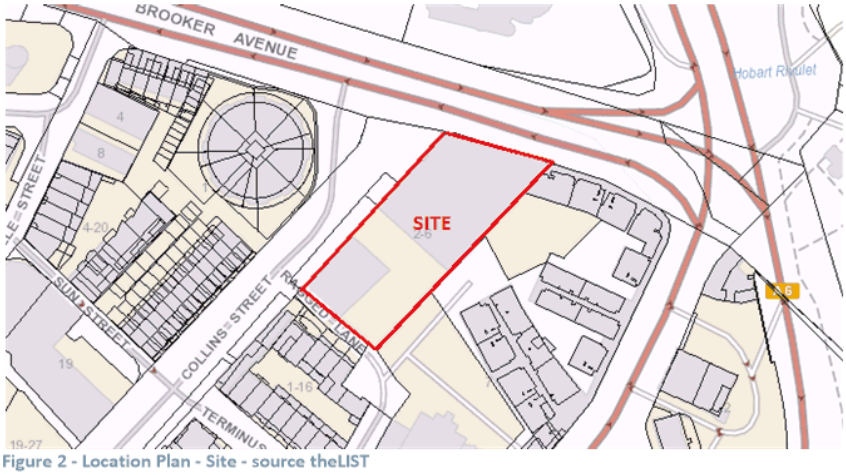


Figure 2 - Location Plan - Site - source theLIST

The former Robert's building has little in the way of architectural merit and adds little to the streetscape. The car park (which is a recent addition to the site) services mainly long term parkers – the hospital, UTAS and office blocks in the CBD.

2. About the Development

2.1 Proposal

The proposed development is described as:

- Ground Level – Hotel lobby, restaurant/cafe (for hotel), small retail shop, coach parking/delivery and ancillary administration spaces, taxi pick up and drop off areas
- First Floor Level – conference facilities and ramp to car parking
- Second to Fourth Floor – car parking – 167 spaces
- Fifth Floor – open podium level
- Sixth Floor – pool, wellness centre and operational areas for hotel
- Seventh to fourteenth first floors – hotel rooms – a total of 256 rooms
- The total height is the building is 51.6m (56.2AHD) with a further 3.5m of plant / equipment and architectural features on the roof.

2.2 Architectural Statement

The proposed architecture has been highly and philosophically considered taking cues from not only the directly adjacent developments and their history, but also that of the city of Hobart itself with its reference to the significance of the landscape as well as the built environment.

Whereas the proposed development challenges a number of points in the scheme we believe the proposal to be measured not only in form but in the story the architecture tells from its place and the high level of complementary community benefits apparent.

The form of the building takes cues from its city context with each opposing façade relating to its context as shown on the diagrams.

The proposal includes a 1000 seat conference facility with associated facilities. It is noted the critical mass of the hotel is directly related to the conference facility allowing Hobart to host large national conferences as a destination.

Recent studies have shown Hobart is in clear need of volume of hotel rooms. The scale of this proposal provides a large indentation in the demand.

3. Site and Title

The property is known as 2 - 6 Collins Street, Hobart.

Legally the site is known as:

Property Address	2 – 6 Collins St HOBART TAS 7000
Property ID	5660219
Title Reference	121603/1

The site is graphically depicted below:

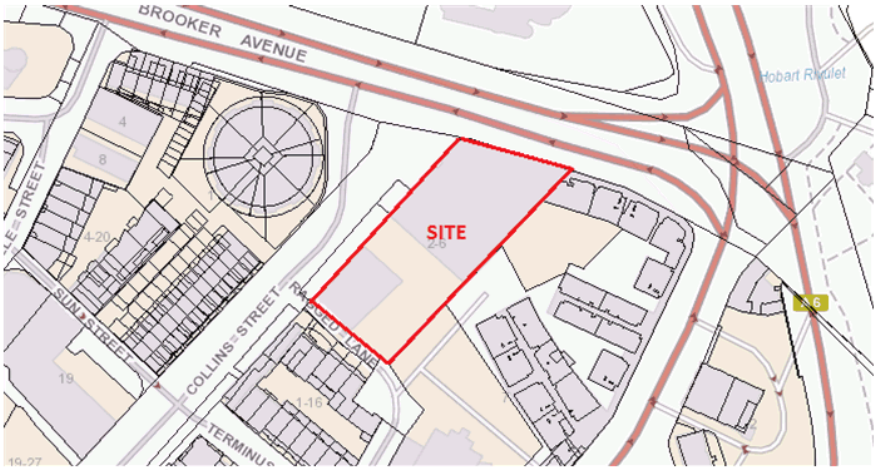


Figure 3 - Location plan - site - source theLIST

4. Use of Site

The subject site is currently occupied by a vacant double storey building which over its life has been incarnated as an office, used for administration, a warehouse and most recently for rural supply sales (agri-business). Two structures currently occupy the site at 2-6 Collins Street, Hobart – the above mentioned double storey brick office space and Half of the subject land parcel functions predominantly as an open air single level commercial car park (long and short term).

5. Surrounding Uses

2-6 Colllins Street sits within an area on the edge of the Hobart CBD where regeneration of historical sites within the Sullivan's Cove precinct is occurring. Hobart continues to grow and mature as Tasmania's capital city, and accordingly the attraction of investors is effectively altering how the built environment is being used. The current mix of uses within the Wapping area and on the edge of the CBD within the Sullivan's Cove area includes commercial, residential and government/community services with infill developments slowly and sensitively revitalising the precinct.

The site abuts the Brooker Highway with the "ABC" precinct to the north. Neighbouring the site to the west is the 'One Collins' residential apartment building. To the east is the 'Old Woolstore' apartment hotel, with a residential complex grouped under the name Wapping abutting Ragged Lane to the south.

The surrounding built form is typified by low density, office and residential buildings with short stay apartment buildings, and hotels punctuating much of the Wapping Activity Area in the immediate vicinity of the subject site between the Brooker Highway and Campbell Street. Larger in scale – ranging in height from 15m to 27mthe Royal Hobart Hospital's 'K-Block' will have a height of approximately 46m;(when topped out by the helipad)- The proposed building will have a height of 51.6m – comparable to the Commonwealth Government Centre at 188 Collins Street, (52m).

Figure 4 - Site in context

Figure 5 - Site in context

Figure 6 - Site in context

6. Sullivan's Cove Planning Scheme 1997 (the Planning Scheme)

The subject site sits within the 'Wapping Corner' – an area on the edge of the Hobart CBD vaunted for its origins as part of Hobarts early settlement. With very few remnants of its heritage either still in existence or intact, the area has been earmarked for redevelopment, originally by the Commonwealth Government funded 'Better Cities Program' in the early 1990's – and within the provisions of the Sullivan's Cove Planning Scheme 1997 (the Planning Scheme).

6.1 Definitions and Use Status

The Planning Scheme has a range of definitions by which to classify uses. In this instance the following definitions best align with the objectives of the proposal:

Visitor Accommodation *Means the use of buildings and spaces for short term occupancy by people who are visitors to the Planning Area, including Residential Hotel, Holiday Unit and Motel.*

Function Centre *Land used, by arrangement, to cater for private functions, and in which food and drink may be served, such as a conference centre or reception centre. It may include entertainment and dancing.*

Other uses (restaurant and shop) are ancillary to the main use of hotel.

Within the zone Visitor Accommodation is a Permitted use and Function Centre is a Discretionary Use.

6.2 Zoning/Activity Area

The site is zoned Inner City Residential (Wapping) in terms of the Planning Scheme. The site is within the Wapping Local Area Plan (LAP) as shown in the figure below:

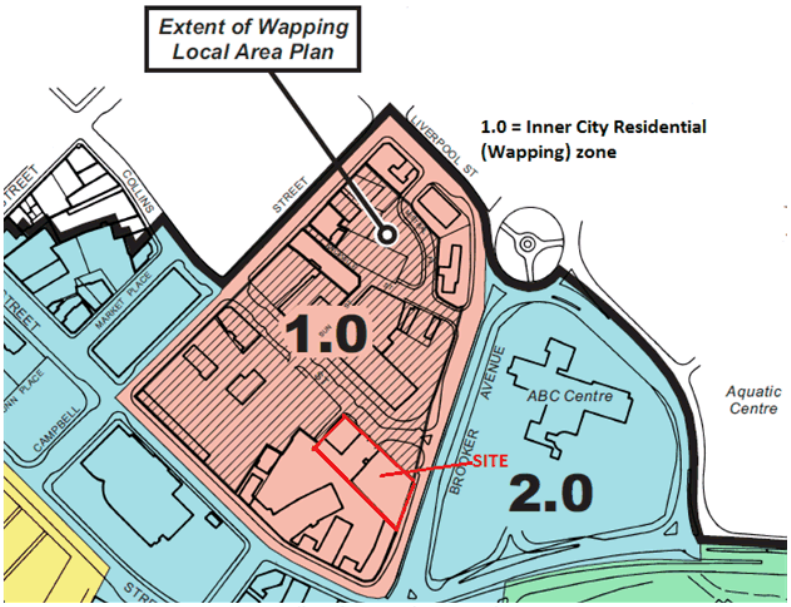


Figure 7 - Wapping Activity Area - Sullivan's Cove Planning Scheme

6.3 General Characteristics of the Activity Area

The Wapping Activity Area has been earmarked for significant redevelopment for residential purposes in the early 1990s as part of the Commonwealth Government's Better Cities Program.

Once a residential and industrial area of small cottages and various industries, and more recently used as a bus depot, Wapping has remained under-utilised for a number of years. Little survives that is recognisably 'historic'. Exceptions to this include St David's Church, Theatre Royal Hotel, Theatre Royal and the Woolstore tourist apartments (formerly known as the Roberts building) which have recently been recycled as tourist apartments.

An Outline Development Plan and Local Area Plan were prepared for the major part of the Activity Area focussing on facilitating residential development behind and above a commercial frontage to Collins Street. Although a number of new residential developments have taken place since the Scheme's inception, significant key sites remain undeveloped.

Areas to the north and west of the main Wapping area are used for a range of activities. These are areas where residential amenity is not high because of noise, privacy and overshadowing issues, and some non-residential uses which are compatible with inner city residential development should be encouraged to locate here. Similarly, some of the sites abutting the city CBD along Campbell Street might also be suitable for non-residential development where they capitalise on possible synergies with neighbouring land uses such as the hospital, or Theatre Royal or where they complement commercial activity along Collins Street.

It is important to achieve the commercial viability of new uses in Collins Street that there is a transition from the city CBD commercial character rather than clear separation of it from Wapping. This transition needs to be expressed in both the urban form and massing of buildings as well as the type and location of uses.

The Local Area Plan is incorporated into this Scheme and will form the basis for use and development control over a large section of this Activity Area.

Areas to the north and west of the main Wapping residential development are used for a range of activities. In addition to promoting residential use of these sites, a range of non-residential uses, which are generally compatible with inner city residential development, will be encouraged.

Use and development controls for the Activity Area are outlined within this Scheme.

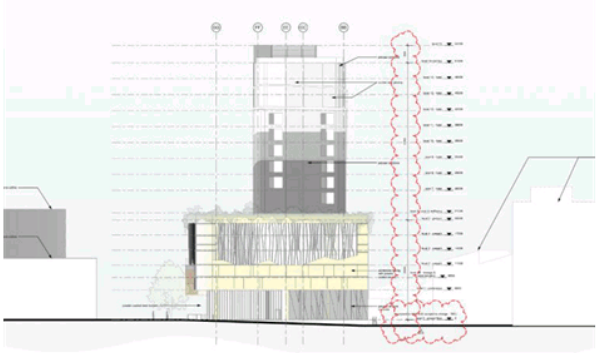
This particular site is not within the Wapping LAP. The site and uses relate well to the commercial type uses which will be "encouraged" in the Activity Area. The Planning Scheme recognises that this area of Hobart is in transition from industrial uses to uses reflecting the contemporary changing character of Hobart as a regenerating Capital city. Due to the proximity of the Wapping Area to the Brooker Highway, and its position at the entrance to the Hobart CBD, it has been recognised residential uses are not appropriate due to noise, privacy and overshadowing issues.

The Planning Scheme also recognises the importance of achieving commercial viability of new, non-residential uses in Collins Street specifically. With very few infill opportunities available in the Hobart CBD coupled with the increasing cost of land, it is increasing difficult to justify low density developments limited to 4 or 5 levels in order to meet a notional planning need. With very few shops, services or activation within this strategically important area, the option of allowing sprawl at the expense of Hobart consuming more land in a geographically constrained state is simply untenable. Car dependency is gradually reducing the amenity of a city with a public transport system yet to be able to cope with and meet the demands of a growing population – unless plot ratios in the Hobart CBD are revisited, revised and allow for optimal though sensitive utilisation of urban space, Hobart will be on track to become a casualty of its very own success

The proposal, in principle, aligns with the character of the Activity Area.

6.4 Objectives of the Activity Area

Objectives	Comments
To provide for the development of an inner city residential neighbourhood providing quality urban housing for a range of household types and income groups.	There is a recognition within the General Characteristics of the Activity Area that there are areas *where residential amenity is not high because of noise, privacy and overshadowing issues.* This would be one of those areas. An exposed frontage to a main highway is not conducive to a residential use. Visitor Accommodation can be considered in such locations as the cost of measures needed to negate noise can be spread across a use providing a high return on investment. Just because the proposal does not provide for residential uses does not mean the development is contrary to this objective.
To ensure that residential development is the primary focus throughout the Activity Area but allow non-residential uses to be developed on a flexible performance approach based on the amenity and characteristics of specific sites.	The Planning Scheme recognises that there are certain parts of the Activity Area which are not suitable for residential use due to *noise, privacy and overshadowing issues.* There are a number of hotels/visitor apartment developments in close proximity to this site. There are also a number of current uses like the Royal Hobart Hospital and a campus of UTAS which would benefit from having a hotel in close proximity (for visitors to those facilities). The proposed development is close to the Macquarie Point area which is the subject of an urban renewal proposal – the activation of this area of the city from heavy industry to education/entertainment activities. A hotel in this location will complement the new direction

Objectives	Comments
	for Macquarie Point. A major conference facility on this site will also bring life and activity to this end of Collins St and spill over into the Macquarie Point development.
To retain and restore where appropriate buildings of cultural significance.	The current building is not identified as having any cultural significance.
To ensure that building masses and facades appropriately relate to the spaces they form. Streets within the Zone be considered as spaces in their own right.	The proposal can be broken down into two components which ensures the building's mass and façade relate to the adjacent spaces/street. The podium, being 5 storeys in height, is proportional to the adjacent apartment building consisting of 6 storeys. The scale of the podium means the tower component of the building is typically not visible whilst standing adjacent the new building within Collins St. 
To encourage architecture of the highest quality which is modern in approach but at the same time incorporate some interpretation of the history of the area as appropriate.	S Group have philosophically considered the context of location, its history and have accordingly imbued the design with references to Hobart's architectural heritage, but also the natural environment surrounding the city of Hobart itself (refer Architectural Description).
To ensure that new development incorporate historic cues, whilst not relying on historical mimicry.	The proposed is not an example of architectural appropriation nor does it seek to engage in architectural facadism. The building envelope is a sensitive response to the history of the Wapping district, to the heritage and prevalent architectural styles of Sullivan's Cove and to a greater degree, the natural landscape of Mount Wellington through the materiality of the design. The proposal does not attempt mimicry in any sense of the word.
To facilitate the transition from the CBD by allowing substantial commercial uses on key sites on the main connecting streets (Campbell and Collins Streets) or in places where reasonable residential amenity is unachievable because of existing traffic or environmental impacts. These commercial uses must not themselves diminish the amenity of or the potential for adjacent residential development.	The commercial use fronting Collins Street is significant however through considered and responsive design, sensitive treatments – inclusive of a double height ground floor with recessed entrance, encourages a positive interplay with the street by providing shelter and separate entrances for co-located building functions/uses activating the Wapping area; in this regard it complies fully with the intent of this clause. Due to proximity and exposure to a major traffic route residential development in this site is not appropriate. The proposal will not diminish the amenity of current residential uses in the precinct. As all adjoining sites are fully developed there will be no loss of development potential brought about by this

Objectives	Comments
	development. The impact of overshadowing is illustrated below – presenting existing shadowing and likely shadowing over the Wapping residential developments.  Full shadow diagrams are shown in the large-scale plans attached to this application.
To encourage frontages of commercial activity only on the ground floor of buildings abutting streets.	The proposal presents a ground floor of commercial activity. By its nature a hotel is a commercial operation. However, the activity of staying in a hotel is more aligned to a residential type use.
To encourage commercial activity in existing buildings where this is required to assist in their conservation.	As the current building will be demolished this clause does not apply in this instance.
To encourage a mix of uses on the sites in the west and north-west of the Activity Area and fronting Campbell Street.	This site does not front Campbell St – nor is it in the west/north-west of the Activity Area.

6.5 Use of Land

The subject site is currently underutilised with a vacant office block/warehousing and a commercial car park at ground level occupying the land parcel at 2-6 Collins Street, Hobart. Per the provisions of the Planning Scheme, the proposed uses of Visitor Accommodation (a Permitted use) and Function Centre (Discretionary Use) prescribed in Section 15.3. and effects on amenity as prescribed in subsection15.3.6. relates to impact on amenity and ensuring any use of land within the Activity Area but not within the Wapping LAP Precinct (as in this case) must not have a detrimental effect on the amenity of the Precinct through:

- Transport of material, goods or commodities to or from the land
- Appearance of any building, works or materials
- Emission of noise, artificial light, vibrations, smell, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit or oil.

Once construction is complete there will be ongoing traffic movements to and from the site ferrying guests, supplies (linen, food, beverages, etc) and wastes. Provision is made for 14.5 m coaches and an 8.8 m delivery vehicle to enter the site, turn and leave in a forward direction via Collins St. These areas front Ragged Lane and are screened by a solid wall. The traffic impact assessment (TIA) demonstrates there will be no significant or detrimental impacts on local traffic flows as a result of the proposed development.

Facilities for the storage of waste and linen are located inside the building on the ground level. These are well recessed from the Ragged Lane frontage and are designed to prevent direct access by guests. This area is also screened from public view by a solid wall. The linen areas are located internally while a large enclosed bin store is located immediately outside the building, under the driveway and ramps. Additional

bins are located along the ground level service corridor which runs internally along the western boundary of the building. These areas are enclosed by roller doors. Wastes will be disposed of in accordance with standard requirements for commercial operations. All kitchen areas will have appropriate extraction and filtration systems in place to ensure exhaust emissions do not impact on the amenity of the locality. Mechanical plant will be appropriately screened and/ or enclosed to ensure noise emissions comply with Australia Standards. There will be no impact on amenity of the locality as a result of wastes from the development.

Night lighting will be incorporated into the facade treatment and where appropriate will also highlight landscaping. The facade generally faces away from adjacent areas and proposed illumination and signage are not considered likely to have a detrimental impact on the amenity of the area.

6.6 Schedules

Within the Planning Scheme are a series of Schedules which need consideration:

6.6.1 Schedule 1 – Conservation of Cultural Heritage Values

Places of Cultural Significance

The site is not identified as a Place of Cultural Significance under this Schedule to the Planning Scheme. The building to the south of the site (the Woolstore) is listed as a Place of Cultural Significance (52 on map below).

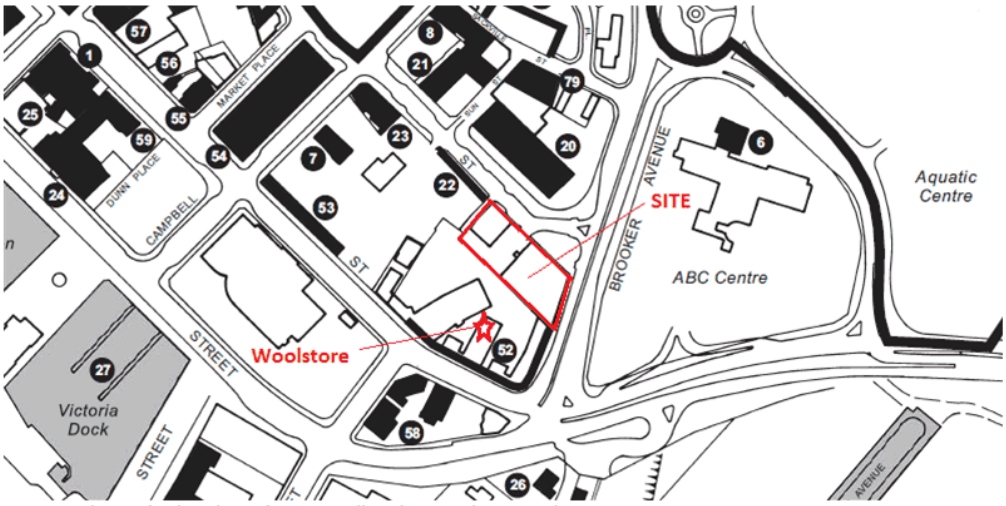


Figure 8 - Places of Cultural Significance - Sullivan's Cove Planning Scheme

A full heritage assessment report has been commissioned to support this development. The following commentary is taken from that report – the report will be attached to the development application under separate cover.

The criteria for assessment of impact on adjoining Places of Cultural Significance are:

Criteria	Comments
'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public space,	Given the former Roberts woolstore and HCC garage façades are 1-2 storey high and are merely facades with contemporary, larger scale development behind, it is

Criteria	Comments
or be more prominent in the street than the adjacent place of cultural significance.	inevitable practically any new development on the subject site will present as a larger scale and prominence than these places of cultural significance in the wider townscape context. This however is not seen as something which is likely to have heritage impact, as the places of cultural significance both derive part of their significance from being representative of the numerous major changes to the pattern of development of the Wapping area and that new development adjacent to these places can be seen as a continuum of that evolution of the area. For over 200 years Wapping has evolved in several distinct stages with larger new forms replacing earlier and smaller scale development in response to the wider evolving townscape – recent developments such as the Old Woolstore apartments, One Collins, Terminus Row and the forthcoming Hedberg Garage development are examples of this new wave and reinvigoration of Wapping which is seen as an acceptable (if not desirable) new phase in the continuum of Wapping's history. To 'under develop' the subject site would perhaps therefore be inconsistent with this precedented tenor of development in the area therefore larger scale development would be consistent with the evolving pattern of development in the area.1
The area of a facade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity.	
'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.	As facades, the value of these places is largely limited to their street frontages and contribution to a very limited area of the streetscape and townscape (although noting the visual prominence of the former Roberts woolstore being on the corner of a very busy thoroughfare). Individually they have streetscape value however do not greatly contribute to any cohesive streetscape or character area. This area of Wapping is of a very diverse character with more recent and larger development typifying the latest phase of that area.
The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.	This document has assessed the heritage values of those adjacent places of cultural significance and has concluded that their predominant significance derives from their ability to represent buildings indicative of major change phases in the Wapping area (i.e. late c19th larger scale commercialisation and Inter-War wholesale site redevelopment) – i.e. Criterion A. Their architectural values (Criterion D) are considered marginal (given that they are only façades and although the places themselves give provide some streetscape contribution they do not form part of any cohesive or important heritage streetscape.

[1] Adjacent Heritage Places Conservation Policy – 2 Collins St – Praxis Environment – Sept 2016

Criteria	Comments
	Any new development of the subject site has some potential to backdrop the places of cultural significance – this however is somewhat of a moot point given that these places are façades and that their own development has in effect already set the precedent for larger backdropping development.
'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.	Any development of the subject site should not attempt to emulate any particular historic form. This is particularly important in this location, given the evolving and diverse pattern of use and development of this area it would be undesirable to strongly emulate one particular aspect of that history over others. Nonetheless, subtle visual cues in the design of any new development may be drawn from any of those historic forms as part of an interpretive approach.

Relating these comments to the development proposal the Praxis report states:

By the nature of the scale of the proposed development, a greater prominence than the places of cultural significance is inevitable – noting also that those places themselves are backdropped in their own right with new buildings of larger scale immediately behind their facades.

The proposed development however provides a key 'courtesy' to the smaller scale street frontage of these places. Although a substantially taller development, the proposal has been formulated in such a way that the street frontages and closely-perceivable form of the building is a four-storey podium, upon which the higher component of the development is stepped back from all edges. This is particularly evident in the immediate adjacency to the former Roberts woolstore façade, where the point of contact with that façade is of the lower form to provide a less abrupt and stepped linkage to the taller portion of the proposed building (not largely inconsistent with the abutment of the existing building). Further the proposed façade has been articulated in such a way that the apparent vertical scale is broken by means of a recessed ground floor and articulation of the lower floors through form, cladding, materiality and tone.

From all close vantage points where the relationship between the adjacent places and the proposed development are viewable as a streetscape collective, the proposed development will read as a larger building than those adjacent, however in the scheme of the overall size of the building this design response has adequately mitigated the impact of such size in particular to near vantage points where the scale will not appear inconsistent with the tenor of recent development in the area (noting that this large scale is acceptable, if not desirable, in any case as representing that long-precedented evolution of the Wapping area).
The podium will provide the predominant backdrop to the adjacent places and from near vantage. Whilst the tower will be visible as a new element in the wider townscape from more distant vantage points, the perception of the tower will be somewhat disjointed to the near and street level relationship of the proposed development and adjacent places.

Places of Architectural Sensitivity

The site is listed in Table 2 to Schedule 1 as being a place of Archaeological interest – 2 Collins Street, Roberts Store and Offices Ref 7 (see map below).

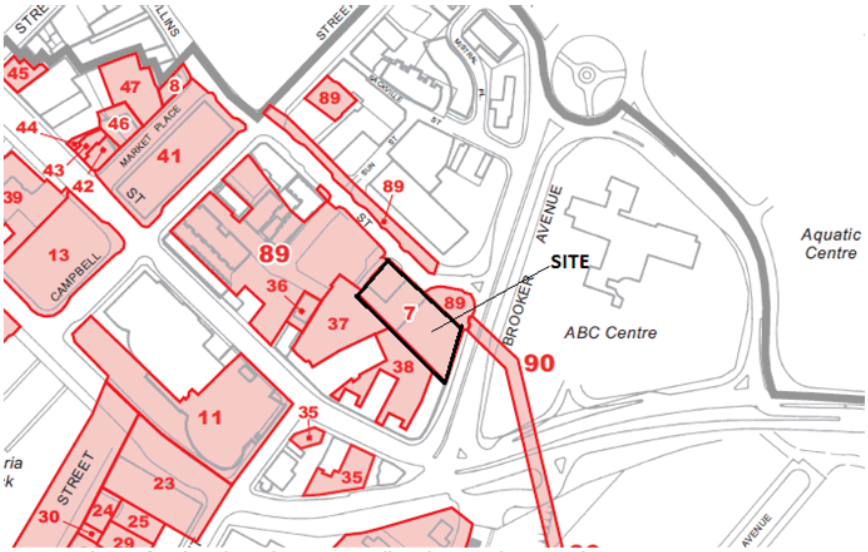


Figure 9 - Places of Archaeological Interest – Sullivan's Cove Planning Scheme

The criteria for assessment of this section are:

Criteria	Comment
The likelihood of the proposed 'building or works' resulting in the removal or destruction of items of archaeological significance.	A particular report on Archaeological Impact Assessment and Method Statement has been prepared by Praxis for this development. The report identified the development of this site from first settlement and has broken the site into areas of likely archaeological significance. *The site generally appears to have been subject to little disturbance, with twentieth-century development being largely on top of (and including) substantial fill to raise the general ground level. This is likely to have encapsulated and protected earlier archaeological remains. The place has the potential to add a greater depth of knowledge on the Wapping area, with a considerable amount of archaeological work having already been undertaken in the area.* *A series of research questions have been posed for the site, which demonstrates its potential to add knowledge to key historic themes of importance to Tasmania (and beyond). Accordingly, the following archaeological zoning plan and summary is proposed:* (the plan follows this table)
The cultural significance of the site.	This aspect is covered in the two Praxis reports.
Evidence of an adequate archaeological reconnaissance and site sampling prior to the	The archaeological aspects of this site have been researched and discussed by Praxis in their report.

Criteria	Comment
approval or carrying out of works.	
The need to reasonably protect potential archaeological significance during the design, and carrying out of works.	As a precautionary principle during demolition and excavation the site will be monitored for any evidence of artefacts from a past era. In the unlikely event that items are found the heritage consultant will be brought into the site to seek advice as to the heritage importance of any finds and to develop a plan to deal with these items. The Praxis report recommends an action plan to deal with artefacts found during works on site.
The need to undertake an archaeological 'watching brief' to be required during the carrying out of works.	

Figure 10 - Hierarchy of zones of Archaeological Interest – Praxis Report

Key to figure 10

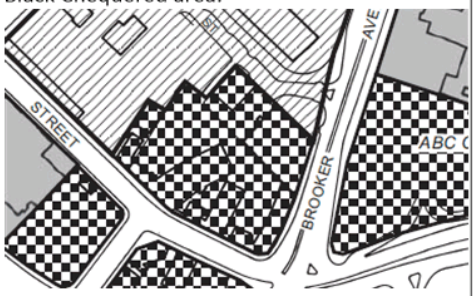
Green = Low Archaeological Impact
Yellow = Medium Archaeological Impact
Blue and Red = Part Low and Part High Impact
Orange = High Impact

6.6.2 Schedule 2 – Urban Form

The Urban Form schedule considers the building/proposal within the context of the streetscape.

Building Form
Section 23.6.1A of the Planning Scheme applies in this instance. The factors to consider are:

Provisions	Criteria	Comment
Height	Buildings to the maximum height for the area shown on Figure 8. Parts of buildings above	Compliance relies on a discretion in regard to height. The Planning Scheme

Provisions	Criteria	Comment
	building eaves or parapets must reinforce the Objectives of this Schedule. From Figure 8 the height for this part of the Activity Area is 15m. Black Chequered area. 	sets no limit as to the extent of the height discretion. Instead it outlines a series of matters (the objectives to the Schedule) which the Planning Authority should consider when presented with a development which seeks a height discretion. As such then the application of the discretion becomes somewhat subjective. The development and how it relates to the objectives of this Schedule are discussed later in this submission. At 50m the proposed building is lessor in height than the under-construction Hobart General Hospital and comparable to many CBD buildings.
Alignment – Primary Space	Buildings must be built to the street line of all primary street frontages, with walls located on the front property boundary and extending across no less than 90% of the primary street frontage. Where a new building is located on a corner with two primary street frontages, this requirement must be satisfied for each frontage. New buildings must not step back adjacent to a Primary Space. The only permissible exceptions to this is in situations where the stepping back is less than 1:20 relative to the height of the wall on the property boundary and where there is a wall to the boundary at least 12m high.	The building is setback at ground level 4.0 – 4.2 metres from the building line of Collins St and 3.6m from the Brooker Highway frontages. This triggers a discretion. The setback has been introduced to give a clear distinction between the new structure and the Woolstore heritage building on the adjoining lot. The setback allows the two buildings to be read in their own setting – distinguishing between the two built forms.
Alignment - Secondary Space	Where applicable, buildings must also be built to, or align with, the secondary street frontage.	N/a – there are no defined secondary spaces associated with this development.
Plot Ratio	Buildings must comply with the plot ratio standards referred to in Table A to this Schedule. From Table A – 21m and above 5.0 Plot Ratio.	The development relies on a discretion in regard to Plot Ratio. In considering this matter the Planning Authority will have regard to: *Any new buildings or works adjacent to a Place of Cultural Significance and which are not more prominent in the streetscape by strong contrast of scale, height, colour and tone with the buildings constructed on the place, and, which are not detailed in a manner which is similar to buildings of cultural significance or which adopts an "historic" appearance.* *Works undertaken in accordance with a Conservation Plan approved by the Planning Authority where required and/or provided.* There is no Conservation Plan approved

Provisions	Criteria	Comment
		for this site. The impact on the Place of Cultural Significance is covered in the Heritage Study by Praxis. The scale of the proposed building is significant – the form setting a new precedent for commercial developments within the Hobart CBD. It is evident the proposal is not an appropriation of the prevalent vernacular - sandstone, Georgian architecture, within the Sullivan's Cove precinct; it does not seek to be. What the proposal does present as is an assertively neoteric, contemporary and articulate manifestation of aspirational design – honest and articulate. At a podium level, the proposal is very much in scale with surrounding development. The tower containing visitor accommodation rises out of the podium at a nominal setback of 12.5m from the podium street facing wall effectively reducing visibility of the tower at street level to negligible. On approach from the west along Brooker Avenue and from the north along the Tasman Highway the scale of the hotel will be patent however its inclusion in a rapidly changing Hobart skyline will not conflict impede or detract from the visual values of Sullivan's Cove nor Mount Wellington. It should be noted distance from the site, relative to land slope, the less relevance a plot ratio is in assessing a development. It should also be noted the urban grain of the Wapping area will not be altered insofar as closing off any existing thoroughfares. At pedestrian level articulated façade treatments will ensure the buildings seem less blend into Hobart's urban streetscape disguising how much of the site is covered by the envelope.
Apparent Size	The length of buildings in street edge elevation must not be more than twice the width of the abutting street.	Whilst the width of the building's façade is greater than twice the width of Collins St, it should be noted a large portion of the façade diagonally faces the turnout from Collins St to the Brooker Hwy, which, is greater than half the width of the proposed façade.
Urban Gardens	Where the construction of a building results in the creation of secondary spaces with public access. These spaces must be fenced at street frontage, landscaped and include facilities for	There are no secondary spaces being created with this development.

Provisions	Criteria	Comment
	pedestrians as appropriate, such as seating.	

Building Surfaces

The matters to consider in terms of Building Surfaces are tabulated within the planning Scheme:

Building Surfaces	Comments
Building Façade to a Primary Space	The site is identified as having a facade to a Primary Space. The proposed finishes are a combination of: • Alucabond or similar spec. cladding • Powder Coated Steel Perforated Mesh • Alucabond or similar spec. louvers • Off Form Concrete Panels • Curtain Wall Glazing • Glazing Suites
Building Façade to a Secondary Space	Not applicable in this instance
Night-Lighting	Night lighting will be incorporated to accentuate walls of the building when illuminated, and where appropriate also highlight the landscaping.
Building Surfaces to Brooker Avenue and Tasman Highway in Activity Area 2.0	The site is not within Activity Area 2 and thus this clause does not apply
Surfaces adjacent to nectar bearing native flora (Tasmanian and exotic eucalyptus, etc).	The configuration of buildings and any adjacent nectar bearing native flora will be designed to prevent bird collisions caused by the reflection of such vegetation or sky in glazing and/or unobstructed views through a surface to an outdoor space. Glazing must be consistent with the DPIWE Threatened Species Unit publication "Prevent window collisions: Save our native birds", or achieve comparable performance.

Objectives of Schedule 2 – Urban Form

The objectives stated as being relative to Schedule 2 are tabulated below with appropriate comments:

Objective	Comment
The traditional urban pattern of Sullivan's Cove is to be conserved. A contemporary adaptation is to be created in development/redevelopment areas.	The proposal will not disturb the urban pattern of development within the Cove; It will however alter the scale of buildings. The proposal does not involve any adaptation of existing buildings nor will its construction affect the road layout.
Views to Sullivan's Cove along primary spaces are to be retained, especially to the River Derwent.	The proposed development will not impede views to Sullivan's Cove along primary spaces; Rather, the tower will function and be used by visitors and locals alike as a landmark within the streetscape from which pedestrians

Objective	Comment
	will be able to articulate their location and orientate the CBD.
Views over the land bounded by Tasman Highway, Brooker Avenue and Liverpool Street from the City and Wapping to the Domain and from the Domain and Tasman Highway to the City are to be retained.	Technically the site is not in the area bounded by the defined roadways. Any views from Collins St to the Domain will be retained – even with this high tower. From within the Wapping residential area (say Terminus Row or Cresswell's Row) there are no views of the Domain. From these spaces the view is buildings of between 3 and 7 levels in height. In terms of views into the City from the Domain it is impossible to retain a view (implies no change) and see a City develop. The proposal will alter the view into the CBD from the Domain. The tower will however present as a light weight structure set on a more substantial podium – scaled to reflect the surrounding commercial buildings. The split between the podium and the tower will only emphasis this light weight structure. The overall height of the building will blend into the CBD streetscape due to the rising topography emanating from the waterfront.
Expression of the Wall of the Cove is to be encouraged where possible.	The site is set to the rear of the Cove Wall and thus does not conflict with this objective.
The bulk and height of buildings must reflect the natural topography of the Sullivan's Cove Planning Area, the amphitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.	Since the scripting of the principles contained within the planning scheme regarding the amphitheatre features of the City and in particular the Cove, there have been many new buildings approved and built which break this feature. There are many buildings on the waterfront which are as equally visually prominent in their setting as this one would appear. Hobart is at a crossroads in its future – it can keep spreading out (aiming to protect features from an era in which building technologies dictated height) and accept the consequences of urban sprawl or it can realise that by allowing taller development in the central area (realistically this is a central city site) the spread of development into green field areas may be stopped or at least slowed. By continuing to resist change the inevitable product is more of the same – unfortunately land prices make "more of the same" an unsustainable option both financially and in terms of urban futures for a developing capital city.
A diversity of building heights and volumes will be encouraged within this over-riding pattern, but buildings must have a respectful relationship to each other and to buildings of identified cultural significance within a street.	The proposal will create a diversity of building height and volumes within a street. The use of a podium at ground level will create a built product which respects the relationship of neighbouring buildings. This aspect is covered in detail within the section relative to Heritage and Cultural Significant Places – refer to the Praxis Report.
New buildings must not be individually prominent in terms of contrast with	The development is in two distinct parts. The podium is scaled to reflect that of the adjoining buildings in Collins

Objective	Comment
neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.	St. This is the element which will be visible from street level within the Precinct. The tower will be setback 12.5 metres from the podium facade and will read as a slender structure from long distance viewpoints. The split between podium and tower will only emphasis the slender nature of the tower. From street level (Collins St) the tower will not be visible at close quarters. In that respect the development will not be individually prominent when viewed in street elevation. 
New buildings should facilitate the creation of 'secondary spaces' on lots in the Cove. Such spaces should be encouraged where they demonstrably create useable pedestrian environments and facilitate pedestrian movement and views.	Development of this site for any meaningful use is limited in the way secondary spaces can be developed. Setbacks allow a widening of open areas to give the impression of a greater public domain, even although these spaces will be maintained as part of the hotel development – thus relieving the public purse.
New urban gardens are to be encouraged in secondary spaces only.	There are no secondary spaces associated with this development.
On the land bounded by the Tasman Highway, Brooker Avenue and Liverpool Street the landscaping should reflect the variety of garden areas and parkland styles that exist in the immediate surrounding area and that mark the transition to the Domain.	The site is not in the area defined in this objective.

6.6.3 Schedule 3 – Public Urban Space

The site is defined as being part of the "Rear of the Cove" Precinct.

This control applies to the construction, exterior alteration or exterior decoration of any building or the construction or carrying out of any works within the public urban spaces identified in the 'Public Urban Space Types' plan. Clearly, all works are within the title boundary and thus on private land – there will be no works within the public realm and thus this section has no application.

6.6.4 Schedule 4 – Signs

Signage as indicated on the architectural plans. It is believed that the proposed signs are reasonable given the scale of the building.

6.6.5 Schedule 5 – Traffic, Access and Parking

The proposed development is located on the periphery of the Sullivan's Cove planning scheme area and fronts the Brooker Highway and Collins St. The integrated development includes tourist accommodation, a conference facility, restaurant, gym and associated support facilities. The development also includes parking for 167 cars for use by guests and staff as well as drop off zones for cars and buses on the Collins St frontage.

The site is located within the Inner City Residential (Wapping) activity area however is not within the area included in the Wapping LAP Precinct. A mix of requirements relevant to traffic and parking are outlined in the general scheme requirements, activity area provisions, Schedule 5 and indirectly in the LAP. These are addressed in this section.

A traffic impact assessment (TIA) was prepared to assess the impacts of the proposed development on traffic in the locality and through this key movement corridor of the Sullivan's Cove area. The assessment was prepared in accordance with the Department of State Growth's *Framework for Undertaking Traffic Impact Assessments*.

Preferred Future for the Cove (Section 6)

The planning scheme contains a number of statements intended to express the preferred future urban character for Sullivan's Cove and the over-arching direction that development must take. Those relevant to traffic and parking include:

- 6.3 An Ecologically Sustainable Future – the reduced scale of parking facilities and the provision of passenger drop offs for light vehicles and buses encourages the use of public transport. This also reflects the manner in which visitors arrive at Hobart and the proximity to the CBD and its attractions and the availability of public transport options. The proposed development is consistent with the intent of this statement.
- 6.4 Creating a Place for People – the development incorporates an active street frontage with a cafe, restaurant, shop and access to the lobby at street level. Access to parking and delivery areas will be managed at one point on the least visually prominent frontage of the site. This not only reduces the impact of on-street parking but maintains a pedestrian dominated environment, both from a visual and physical perspective. The proposed development is consistent with the intent of this statement.

Planning Principles for Management of Activities in the Cove (Section 7)

The scheme also contains strategic planning principles to guide development and to be considered in the design of future development. Those relevant to traffic and parking include:

- 7.3.4 Efficiency Principles
  - Parking supply within the Cove should be designed and administered to facilitate visitor access, rather than CBD commuters and other long-term parking space users. Long term commuter parking within the Cove should be discouraged.
  - The visual dominance of car parking throughout the Cove should be reduced, particularly in the Central Cove area.
- 7.3.6 People in the Cove
  - The Cove is to be promoted and developed as an attractive pedestrian environment.
  - New use and development should ensure that pedestrian amenity and safety is not unreasonably compromised
  - Developments which incorporate convenience facilities, retailing, recreational activity, pedestrian amenity and visual interest will be encouraged at street level.

The parking provided on site will not be accessible to the public and will not be visible from the street. Access to the car park is located on the least visually prominent corner of the secondary street frontage and will not dominate sight lines or interfere significantly with pedestrian activities. An interactive frontage is proposed which incorporates the cafe, restaurant, shop etc and retains existing street art and landscaping. The proposal is consistent with these principles.

Activity Area Provisions (Section 15.2)

The objectives of the activity area relate to the development of the Wapping area as a transition zone between the commercial functions of the CBD and nearby residential precincts with significant heritage and cultural values. This includes active commercial frontages at ground level and other uses where performance criteria are met.

The consistency with this provision is demonstrated elsewhere in this report however the development proposed includes an active streetscape with commercial activities (cafe, restaurant, shop, business centre and hotel lobby) at ground level, including pedestrian access and the Collins St passenger drop off. The proposed access for pedestrians and vehicles have been located and designed to be consistent with the objectives of the activity area.

Local Area Plan Provisions (Section 15.5)

The land is not within the Wapping LAP Precinct and therefore the provisions of the LAP do not generally apply, except where specifically referenced in the planning scheme. There is however some cross-over between provisions and it is considered appropriate to address the intent of the LAP as it relates to traffic and parking.

The statement of desired future character for the Wapping LAP area states that the over-riding intent of the LAP is to achieve sustainable development outcomes and good urban design focussed on inner-city living. In line with this, the level of parking provision should be minimal and "located and accessed in a manner that does not diminish the amenity of the street spaces. The number of parking spaces provided represents approximately one third of the number of accommodation units proposed. Parking is provided above street level and is accessed through a controlled point off Collins St. The building maintains a large setback to the Brooker Highway and Collins St and the parking in no way dominates either streetscape.
There is a passenger drop off point on the frontage of the development which is consistent with other scheme provisions and which is incorporated into key streetscape elements of the overall design. The proposed parking is consistent with this statement of desired future character.

Schedule 5 Provisions (Section 26)

In line with the over-arching future use statements and planning principles considered above, the provision of on-site parking is not generally considered consistent with the intent of the scheme as it relates to the protection of aesthetic values and amenity within Sullivan's Cove. Notwithstanding this, Schedule 5 does trigger consideration of the need for parking and indirectly, the provision of parking for certain uses. These provisions also relate to demonstration of a need for parking and consideration of the impact of providing parking on the values of the Cove. The requirements of Schedule 5 are addressed in this section.

26.2 Principles of development

The scheme contains the following principles for guiding development:

- Development will not be granted a permit unless:
  (a) It will facilitate the mutual compatibility of public and private transport;
  (b) It can demonstrate either:

(i) that it will not create traffic flows and movements that are detrimental to safety or amenity; or

(ii) that any such flows or movements can be accommodated through engineering works or traffic management arrangements – on or off site – that are satisfactory to the Planning Authority;

(c) It can make adequate provisions for the direction, access, turning and parking of all vehicular traffic;

(d) It can provide for pedestrian movement, in accordance with the requirements of the Planning Authority.

- Any provision for parking will aim to:
  (a) Encourage pedestrian and cycle access, amenity and safety; and
  (b) Address the essential and short term parking demands of customers/visitors in the Cove; and
  (c) Discourage long term commuter parking within the Cove.

The level of parking provided on site will not negate the need for public transport or discourage pedestrian access to attractions and facilities within the Cove. It will however provide parking for those guests who bring their own vehicle, particularly Tasmanian residents who have limited alternatives to private transport when travelling to Hobart. Providing no parking at all for the development would be counter to the objectives of the scheme aimed at reducing on-street parking congestion and encouraging the development of the locality for tourism and other uses. The restriction of the number of spaces to approximately one third of that recommended in the LAP encourages guests to use alternative means of transport.

The TIA assessed the levels of traffic expected to be generated as a consequence of providing parking on site and determined that road infrastructure within the locality could accommodate the traffic at an acceptable level of functioning upon completion and in the future when background traffic levels have increased.

The traffic management proposed, including entry and exit points, the pedestrian drop off and bus loading area, is sufficient to cater for the level of vehicular and pedestrian traffic likely to be generated by the development. These have been located within the development to minimise impacts on pedestrian pathways and to reduce impacts on sightlines and aesthetic values. Car parking facilities are located above ground level and will not dominate the streetscape. Being located on levels 2 – 4 of the development, it will not be visible from the street. Parking has not dictated the site layout or the design of the building.

Access and manoeuvring areas comply with Australian Standards and can safely accommodate the types of vehicles likely to use the site.

The proposed development includes an interactive pedestrian friendly frontage and includes facilities to facilitate public transport. Staff showers are provided which will suit the needs of cyclists.

26.3 Objectives for Traffic, Access and Parking in Activity Areas

The site is within the Inner City Residential (Wapping) Activity area. This clause states that the car parking objectives to be adopted for this area are those contained within the Wapping LAP (Clause 15.5 of the scheme), even though the site is located outside the boundaries of the LAP.

The provision of any on-site parking must however be considered in light of the over-riding principles for development within the Sullivan's Cove area and the Statement of Desired Future Character for the Wapping area. These both provide for a minimal level of parking to encourage sustainable transport options and design outcomes that result in an interactive, people focussed streetscape.

There are no specific objectives for traffic and parking provided in the LAP however minimum parking requirements are provided. These are discussed in 26.4.3 Parking Standards below. Parking is provided on site however is considered to be consistent with these objectives.

26.4 Guidelines for Development Control

26.4.1 Traffic Generation
The LAP Guideline for traffic and parking states that the area should provide an "enjoyable, secure, safe and convenient routes for cars, pedestrians and cyclists". The provision of parking on site will reduce on street parking pressures and provide convenient, secure parking for guests. Reduction of on-street parking congestion enhances the residential amenity for permanent residents and managed access to and from the development allows for smooth traffic flows along Collins St.

The guidelines for traffic generation provide that development which will result in an increase of traffic shall accommodate that traffic in line with safety requirements and in consideration of amenity. The objectives for the maintenance of amenity within the Sullivan's Cove area, and the Wapping LAP area more specifically, are outlined above and are included in the following consideration of traffic and parking associated with the proposed development.

26.4.2 Access Requirements
In line with the guideline in Section 15.5.11 of the LAP, parking has been provided within the development to encourage off-street parking for visitors, maintaining the focus of Collins St and the broader area as pedestrian friendly and a 'people place'. No ground level parking is proposed with drop off facilities incorporated to ensure the safety of visitors and other pedestrians. The main drop off zone is proposed on the Collins St frontage with coach facilities and delivery vehicle areas proposed on the Ragged Lane frontage (no direct access to the lane is proposed).

Separate access to and exit from parking levels is provided with a two-way 6.6 m wide driveway proposed. Pedestrian access is provided through elevators in the centre of the building accessible via the foyer. This is consistent with and exceeds the requirements of this clause.

26.4.3 Parking Standards
The proposed development incorporates tourist accommodation, a conference facility and associated gym and dining facilities. When considering the parking requirements for the development, an assumption is made that visitors staying in the accommodation will also use the conference and dining facilities, and vice versa.

Consistent with the principles referred to above, parking is not proposed for all components of the development, instead being based on the rates for Holiday units, a component of the broader Visitor accommodation use for which approval is being sought. Under the provisions of the LAP, this use requires 1 space per unit which would equate to 256 spaces. It is proposed to provide 167 parking spaces with the development.

It is considered that the proposed development provides an appropriate level of parking considering the anticipated number of users and the desired outcomes for streetscape and development of inner city amenity.

26.4.4 Nature of Parking
Parking is provided within the building and above ground level to minimise impacts on pedestrians, amenity and streetscapes. The car parking layout has been designed to conform with Australian Standards. The number of spaces has been chosen as a compromise to meet the needs of the users of the site while respecting the planning scheme objectives seeking to avoid a proliferation of parking within Sullivan's Cove.

The TIA determined that the access to and from the building was appropriate and that the road infrastructure in the locality could accommodate the projected increase in the short and long term.

26.5 Matters to be Considered
The TIA demonstrates that the traffic generated by the development will not detrimentally impact on the functioning of any roads adjacent the site, including the Brooker Highway, or in the wider locality which includes the port area. The proposed development does not impact on any key site listed on part of the scheme.

Access to parking areas is provided on the least visually prominent frontage corner of the site (corner of Collins St and Ragged Lane). The TIA indicated very little traffic uses this lane and the location of the access at this point will not disrupt local traffic flows. The location of the access next to the lane consolidates the point of vehicle movements rather than having multiple crossings for pedestrians to negotiate. Location of the parking above street level maintains the pedestrian focus of the streetscape and when coupled with the ground level components of the development, enhances the human scale of the locality and satisfies the planning scheme objectives.

6.6.6 Schedule 6 – Subdivision

There is no subdivision involved with this proposal.

6.6.7 Schedule 7 – Demolition

Any demolition associated with this proposal relates to the existing Roberts building. Thus, there will be no demolition without an approved development. On that basis, the demolition associated with the proposal complies with this schedule.

6.6.8 Schedule 8 – Environmental Management

Not applicable – the proposed use constitutes neither a Permissible 'Level 1' activity nor a Permissible 'Level 2' activity.

6.6.9 Schedule 9 – Telecommunication Infrastructure

The proposal will have no impact on telecommunication infrastructure.

7. State Policies

The proposal does not impact on any approved State Policies.

8. Conclusion

With demand continuing to outstrip supply and Hobarts aging accommodation options failing to keep pace with visitor expectation, it has never been more consequential for the city to adopt and engage with developers seeking to boost, bolster and secure Tasmania's share of the tourist dollar. Whilst initially the proposal may be seen as incompatible with the urban scale of Hobart, the opportunities and confidence the proposal will yield in the way it seeks to engage with the city socially, economically and environmentally will ameliorate any fears the amenity, and unique interconnected precinctual character of Sullivan's Cove has been all but ignored.

The contorted elevation and orientation of the site – a product of Hobart's undulating topography and irregular grid layout – a form which has adapted to Hobarts development since settlement has resulted in a sensitive interface with Brooker Avenue, the Tasman Highway and by fortuity presenting as an opportunity for the adoption of an inspiring landmark at the entrance to the CBD. The area bound by the is in desperate need of rejuvenation and activation. The development and what it will offer insofar as sorely needed

modern lodgings, a functions and exhibition space able host events for up to 1000 people, the addition of food and beverage options in a deficient part of the CBD to service the areas residents and those studying and working at UTAS, the Magistrates Court, the RHH and opposite at the ABC and the number of jobs it will generate both during construction and when open should not be discounted.

The hotel will not only generate significant economic activity, but its development will arguably be further proof – a catalyst for investors, developers and those looking to Tasmania, that our island state is indeed open to change and open for business. The building's form has been designed to sensitively articulate its place within Hobart; the podium– with nuanced references to Tasmania's natural environment through form, materiality and scale affirms the development as wholly sympathetic to surrounding commercial developments. The tower – which is considerably set back from the streets edge will only be seen from height or distance; at ground level, the articulation of the buildings form by inclusion of a taller ground floor and the wrapping of the podium around levels 1 to 5 will create the illusion of a building more in sync with the height and scale of its more vertically restrained neighbours.

The building height will challenge widely accepted building heights in this area, but it will not shirk from its responsibility in addressing the question of density by taking full advantage of the sustained truth Hobart is a developing capital city; To continue with low level development may appease some regarding heritage outcomes but in the long run, without due consideration of intelligent and adaptive land use, underutilisation will lead to further unsustainable urban sprawl with development pushed into green fields.

Fortunately, there is no limit placed on the degree of discretion the Planning Authority can consider in terms of a buildings height. The Authority has only to consider a range of social, environmental and economic matters – consider, not agree with – in arriving at their decision.

Society has various needs and expectations such as protection of the environment, economic well-being, various social needs and, proper management of resources and infrastructure; planning aims to meet these by addressing aspects of social economic, environmental and social wellbeing affected by land use and development. Environmentally – the proposal utilises existing land in the CBD. Visually, some will be challenged by the scale of this proposal - its orientation is sympathetic to the location, encouraging of more robust densities than elsewhere in Hobart. Economically – this scale of development will have a compounding economic impact on the city in terms of employment and new income. Socially – a hospitality development of this scale will draw down on the skills and talents of many looking for work in construction and hospitality. It will also show renewed confidence in the city – signalling Hobart has confidence and is prepared to take the next step in its development as a Capital City.

Contact
Ian Abernethy
(03) 6323 1943
iabernethy@pittsh.com.au

transport | community | mining | industrial | food & beverage | carbon & energy



Brisbane
Level 2
276 Edward Street
Brisbane QLD 4000
T: (07) 3221 0080
F: (07) 3221 0083

Hobart
199 Macquarie Street
GPO Box 94
Hobart TAS 7001
T: (03) 6210 1400
F: (03) 6223 1299

Melbourne
Level 1, HWT Tower
40 City Road
Southbank VIC 3006
PO Box 259
South Melbourne VIC 3205
T: (03) 9682 5290
F: (03) 9682 5292

Devonport
Level 1
35 Oldaker Street
PO Box 836
Devonport TAS 7310
T: (03) 6424 1641
F: (03) 6424 9215

Launceston
Level 4
113 Cimitiere Street
PO Box 1409
Launceston TAS 7250
T: (03) 6323 1900
F: (03) 6334 4651

E: info@pittsh.com.au
W: www.pittsh.com.au

incorporated as
Pitt & Sherry (Operations) Pty Ltd
ABN 67 140 184 309

CONSULT AUSTRALIA
Member Firm

pitt&sherry

Fragrance TAS-HOBART (Collins) Pty Ltd

2 - 6 Collins Street

Project No. J002192

Project Address: 02 - 06 Collins Street Hobart

Date: 14/03/2018

Issue: DA - V2

Level 1, 90-92 Murray Street,
Hobart Tasmania 7000
t. 03 6251 3906

Level 1, 10-14 Paterson Street
PO Box 1271 Launceston Tasmania 7250

w. www.sgroup.com.au
f. sgroupdesign

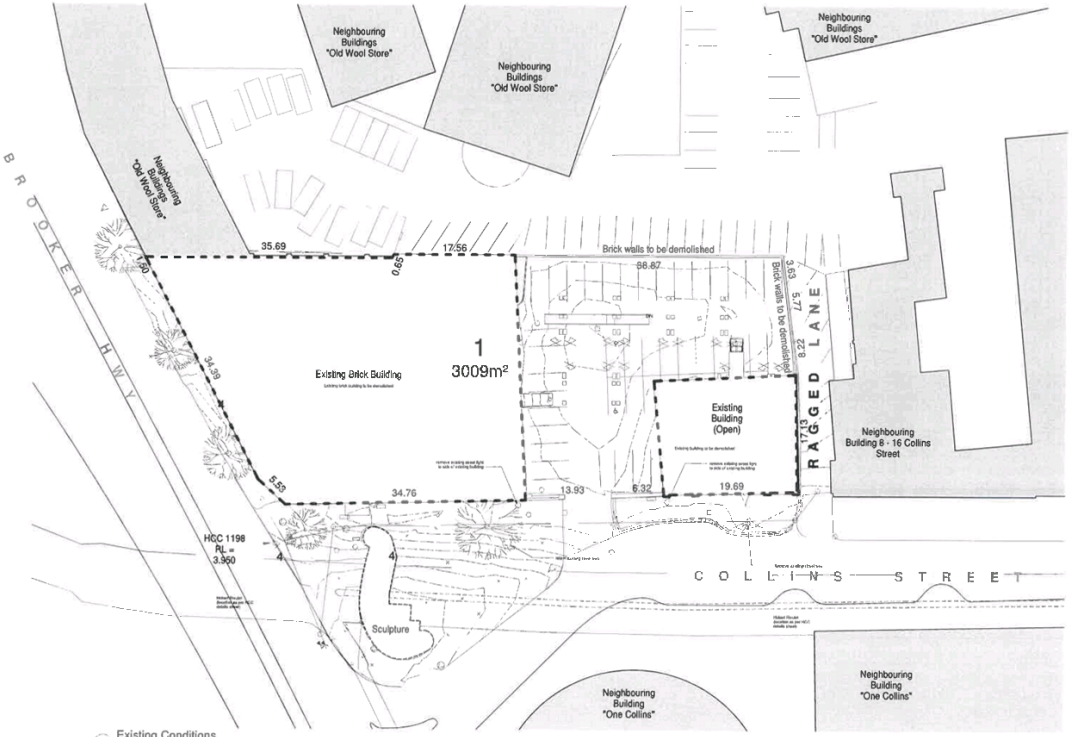
Sheet Number	Sheet Name	Current Revision	Current Revision Date
A01	Existing Conditions / Demolition	Nil	14/03/2018
A02	Site Plan	C	14/05/2018
A03	Ground Floor Plan	C	14/05/2018
A04	Conference Facilities	B	09/04/2018
A05	Storage & Administration	Nil	14/03/2018
A06	Carparking	B	09/04/2018
A07	Carparking	B	09/04/2018
A08	Carparking	B	09/04/2018
A10	Pool & Wellbeing	Nil	14/03/2018
A11	Hotel Rooms Levels	Nil	14/03/2018
A101	Collins Street Elevation	C	14/05/2018
A102	Southern Elevation	C	14/05/2018
A103	East Elevation	C	14/05/2018
A104	South West Elevation	C	14/05/2018
A105	Sections	C	14/05/2018
A200	Shadow Diagrams	Nil	14/03/2018
A201	Context Modelling	C	14/05/2018
A911	FECA Schedule	Nil	14/03/2018

architecture

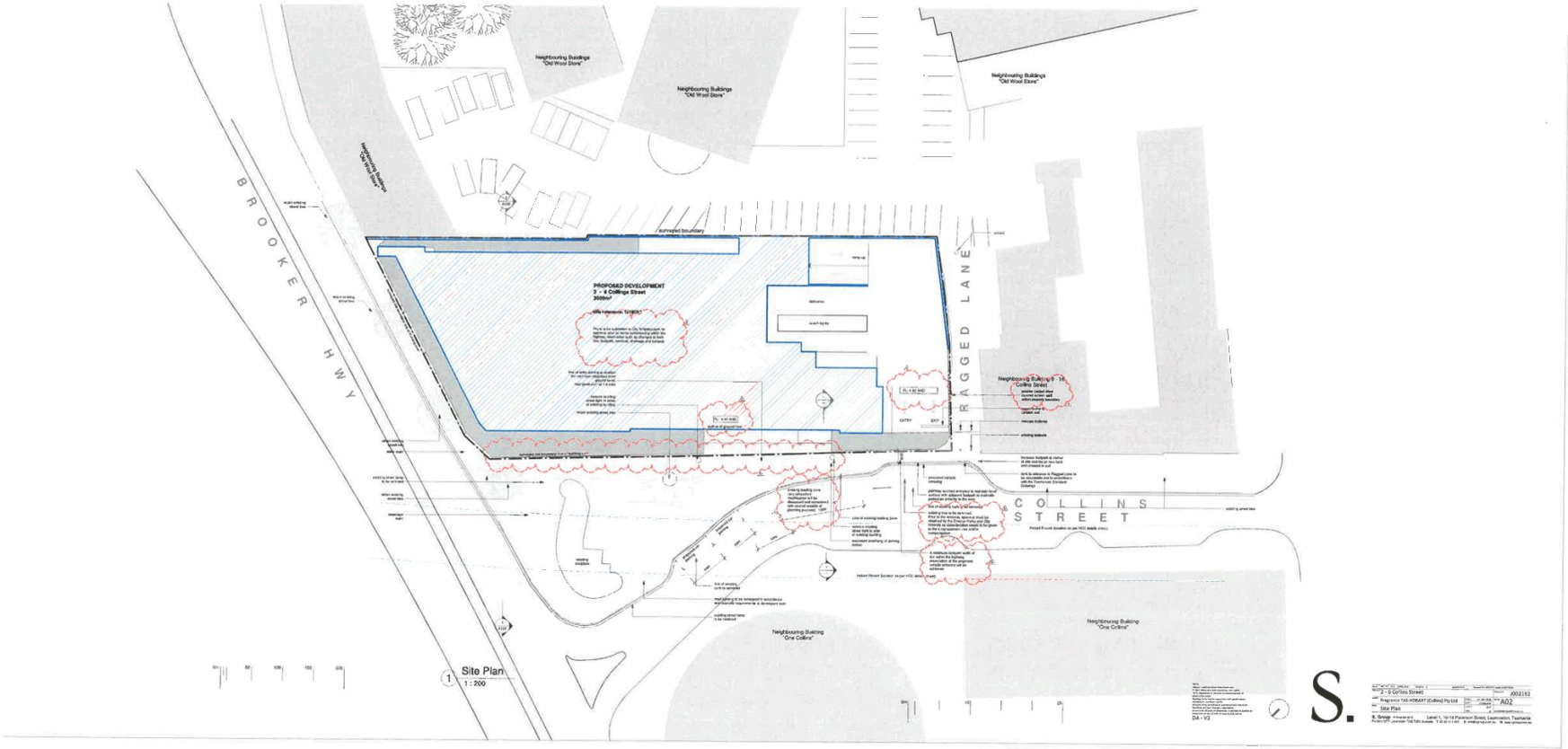
development

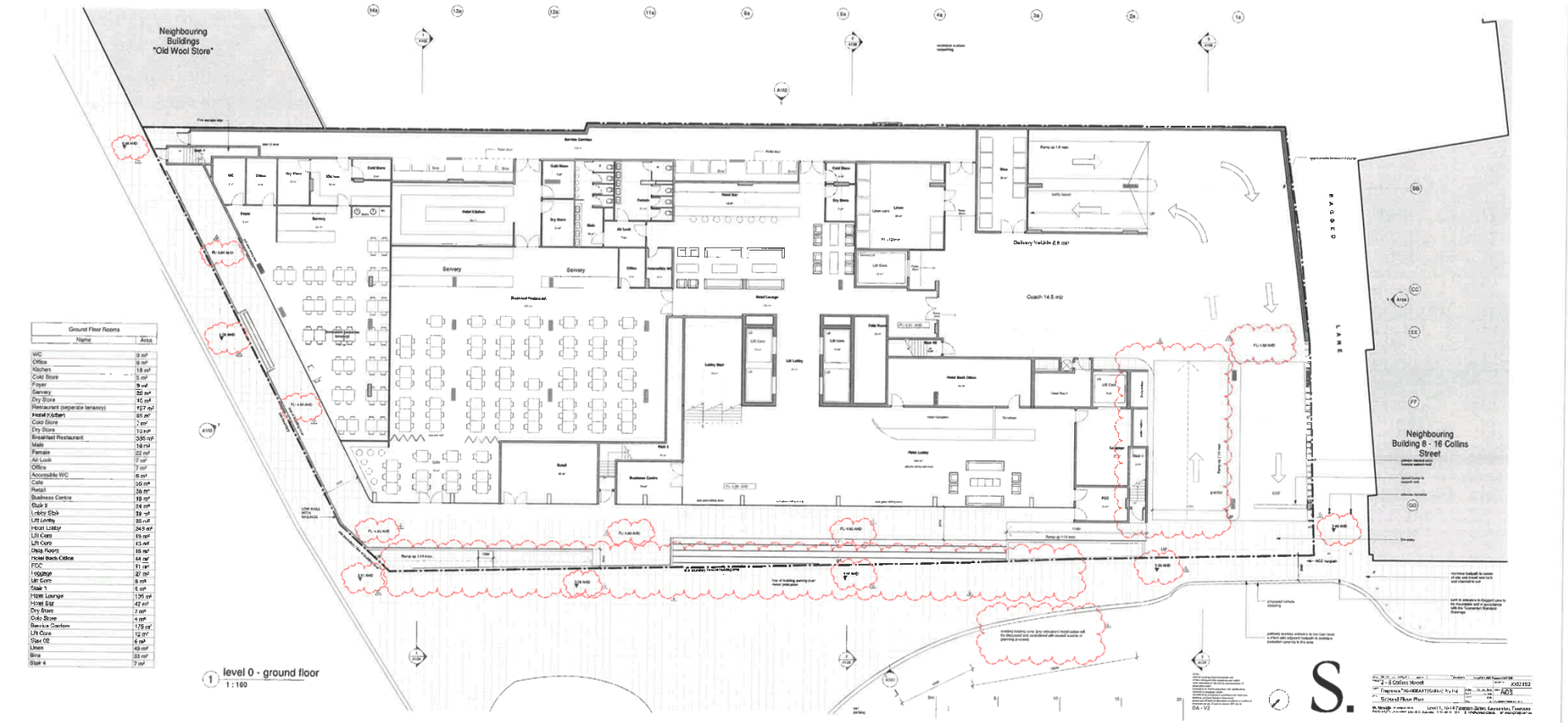
strategic design

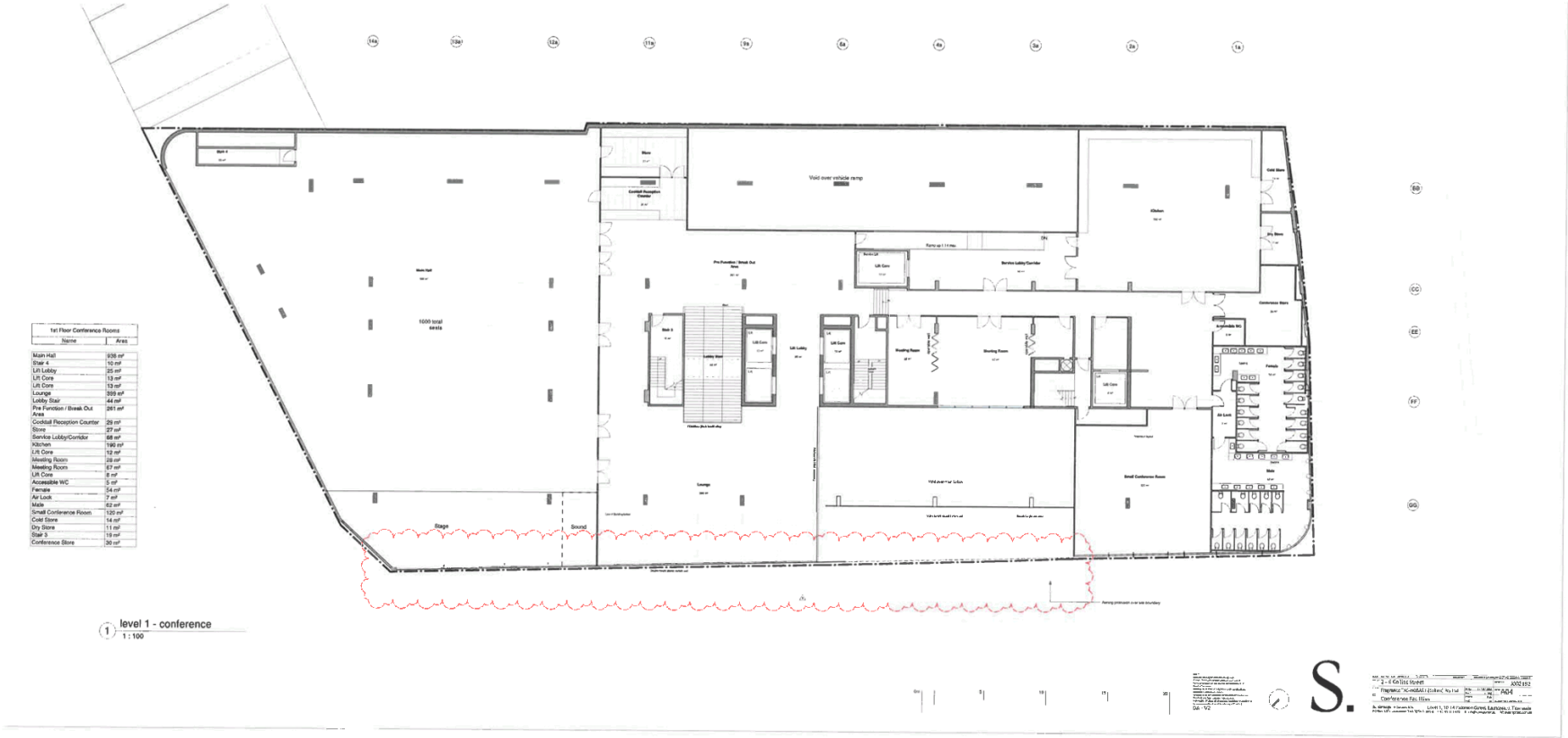
S.

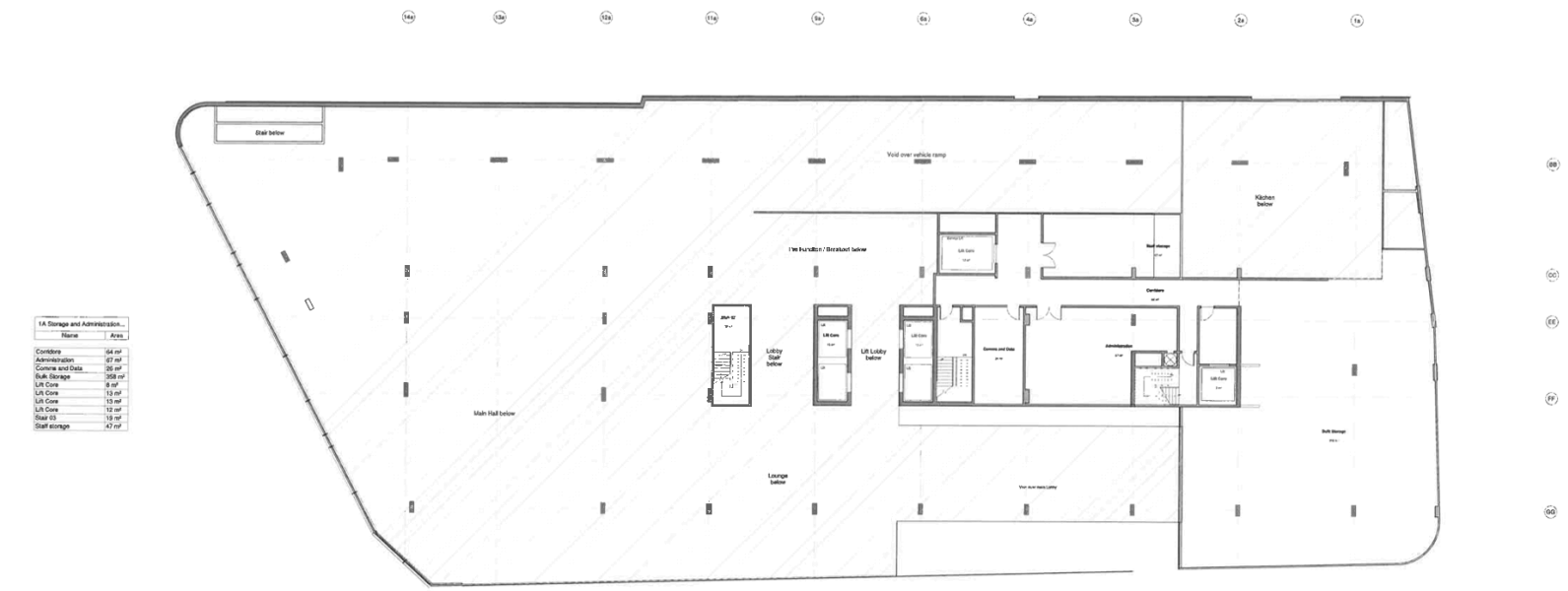

Neighbouring Buildings "Old Wool Store"
Neighbouring Buildings "Old Wool Store"
Neighbouring Buildings "Old Wool Store"
Neighbouring Buildings "Old Wool Store"
B R O O K E R H W Y
35.69
0.65
17.56
Brick walls to be demolished
88.87
3.83
5.77
6.22
Brick walls to be demolished
R A G G E D L A N E
1
3009m²
Existing Brick Building
Existing Building (Open)
Neighbouring Building 8 - 16 Collins Street
34.59
5.55
34.76
13.93
6.32
19.69
HCC 1198
RL = 3.950
C O L L I N S S T R E E T
Sculpture
Neighbouring Building "One Collins"
Neighbouring Building "One Collins"
Existing Conditions
1 : 200


2-6 COLLINS ST
Location Plan
1 : 2000


BROOKER HWY
RAGGED LANE
COLLINS STREET
PROPOSED DEVELOPMENT
2 - 6 Collings Street
Neighbouring Buildings
"Old Wool Store"
Neighbouring Building
"One Collins"
Site Plan
1 : 200

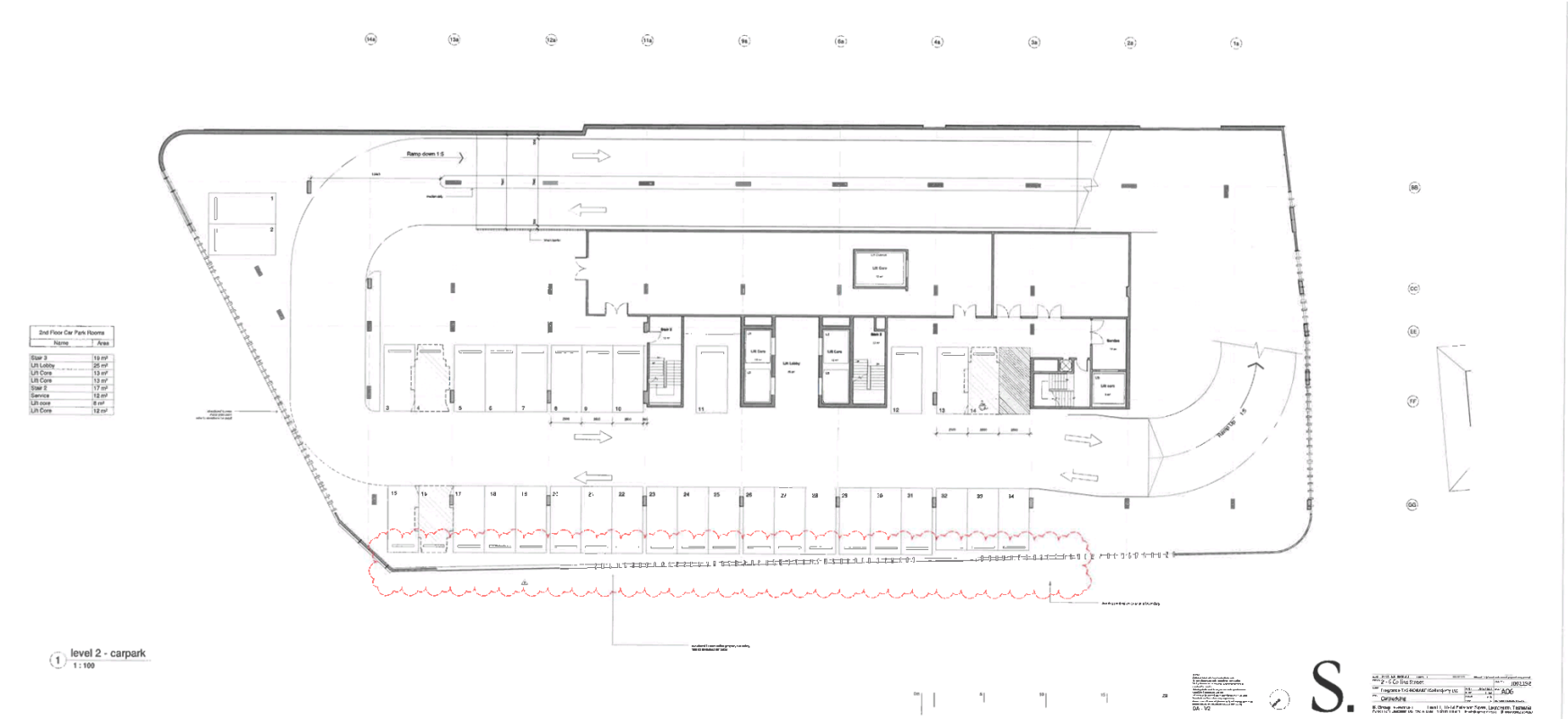

Neighbouring Buildings "Old Wool Store"
Neighbouring Building 8 - 16 Collins Street
RAGGED LANE
Ground Floor Rooms
Name
Area
level 0 - ground floor
1 : 100

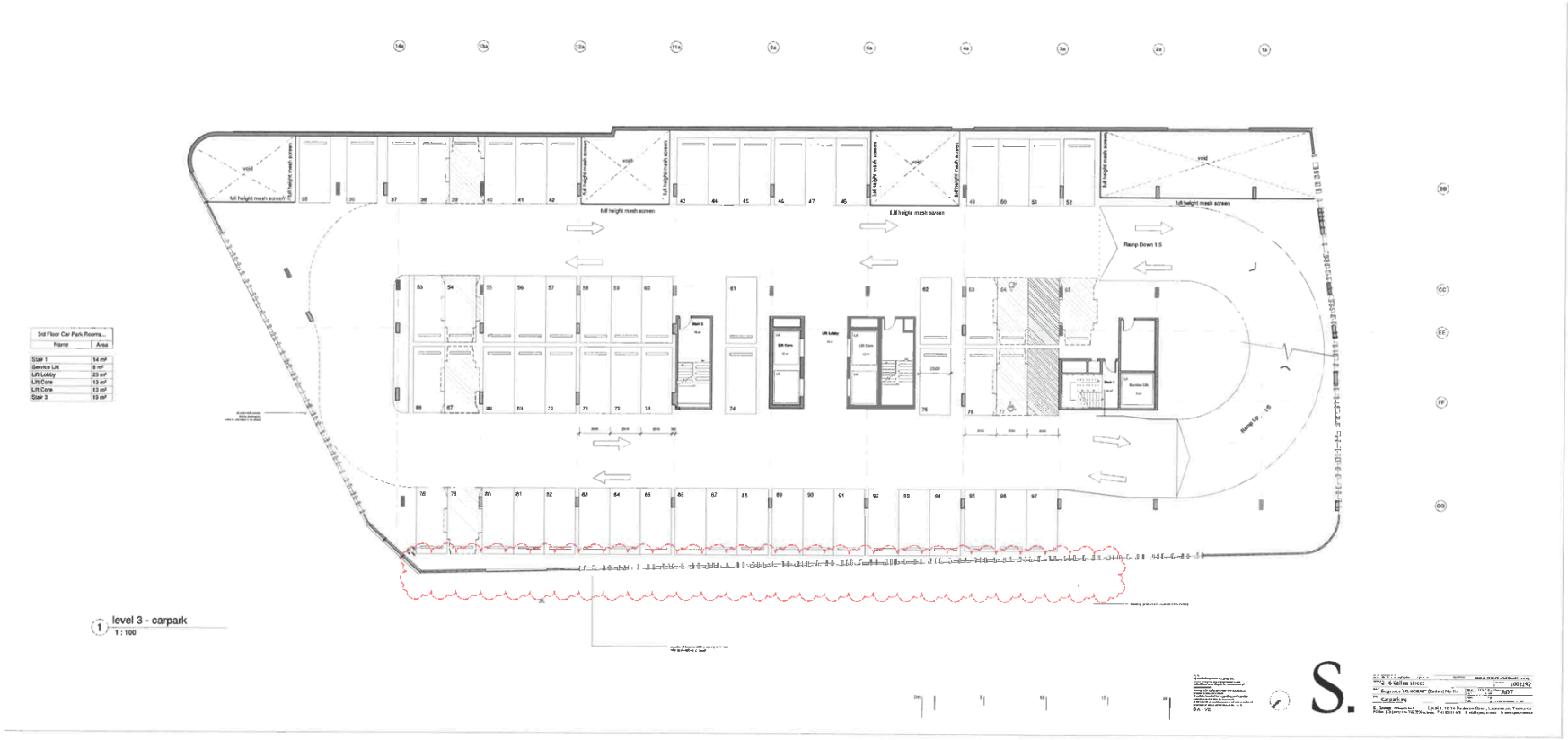

1st Floor Conference Rooms
Name | Area
Main Hall 938 m²
Stair 4 10 m²
Lift Lobby 25 m²
Lift Core 13 m²
Lift Core 13 m²
Lounge 399 m²
Lobby Stair 44 m²
Pre Function / Break Out Area 261 m²
Cocktail Reception Counter 29 m²
Store 27 m²
Service Lobby/Corridor 68 m²
Kitchen 190 m²
Lift Core 12 m²
Meeting Room 28 m²
Meeting Room 67 m²
Lift Core 8 m²
Accessible WC 5 m²
Female 54 m²
Air Lock 7 m²
Male 62 m²
Small Conference Room 120 m²
Cold Store 14 m²
Dry Store 11 m²
Stair 3 19 m²
Conference Store 30 m²
Void over vehicle ramp
1000 total seats
Stage
Sound
level 1 - conference
1 : 100

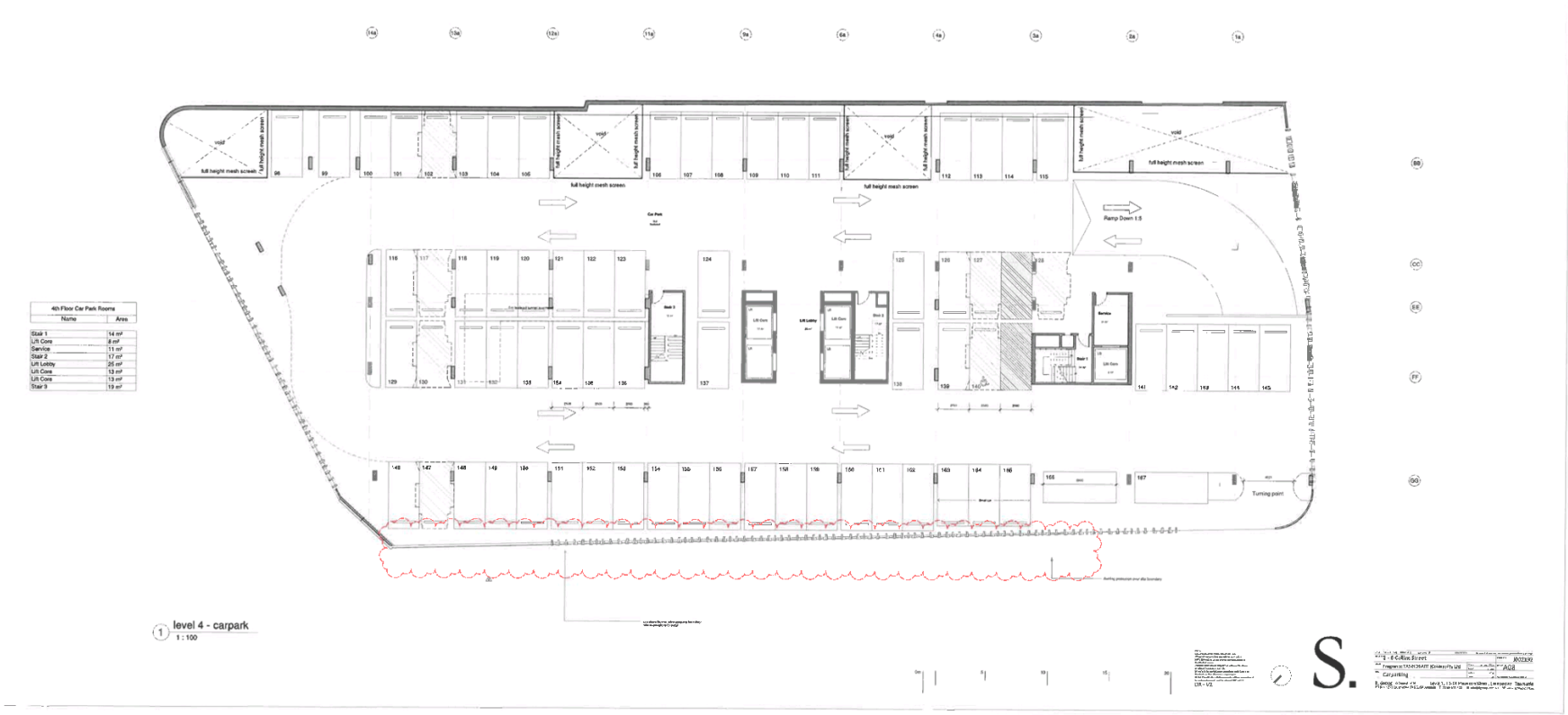


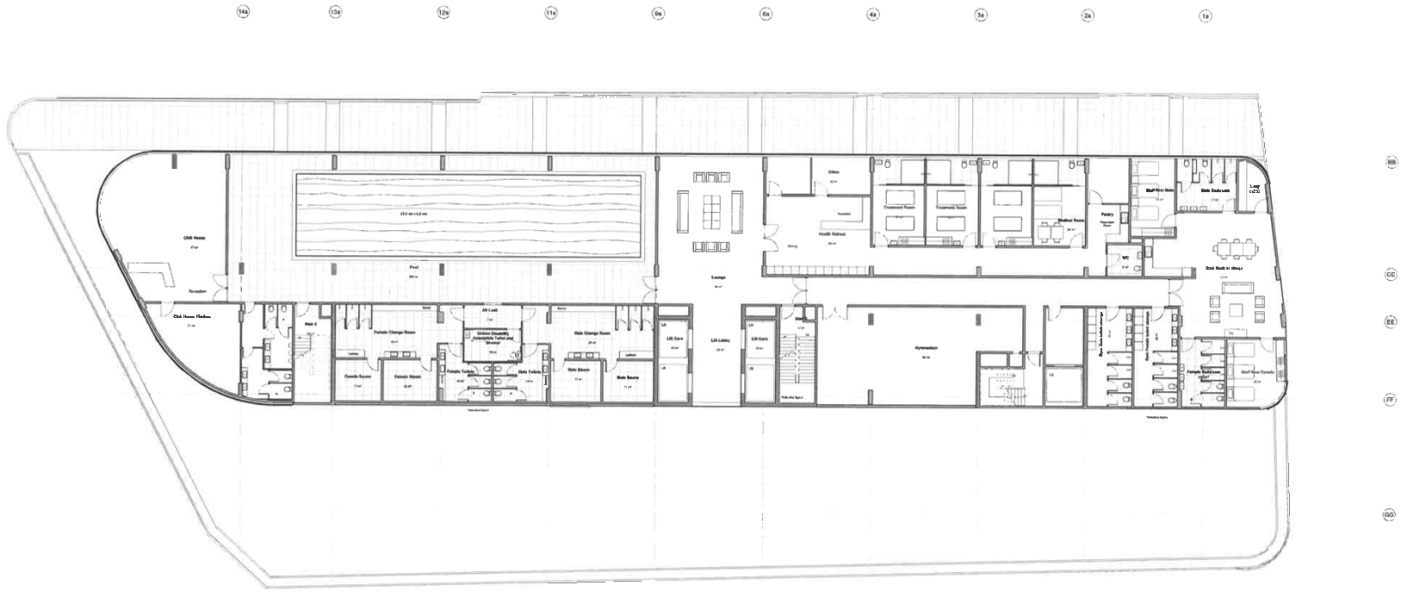
1A Storage and Administration...	
Name	Area
Corridors	64 m²
Administration	67 m²
Comms and Data	26 m²
Bulk Storage	358 m²
Lift Core	8 m²
Lift Core	13 m²
Lift Core	13 m²
Lift Core	12 m²
Stair 03	19 m²
Staff storage	47 m²

1 level 1A - storage & administration
1 : 100


2nd Floor Car Park Rooms
Name
Area
Stair 3
19 m²
Lift Lobby
25 m²
Lift Core
13 m²
Lift Core
13 m²
Stair 2
17 m²
Service
12 m²
Lift core
8 m²
Lift Core
12 m²
Ramp down 1:6
1
level 2 - carpark
1 : 100


3rd Floor Car Park Rooms...
Name | Area
Stair 1 | 14 m²
Service Lift | 8 m²
Lift Lobby | 25 m²
Lift Core | 13 m²
Lift Core | 13 m²
Stair 3 | 19 m²
full height mesh screen
void
Ramp Down 1:5
Ramp Up 1:5
1 level 3 - carpark
1 : 100

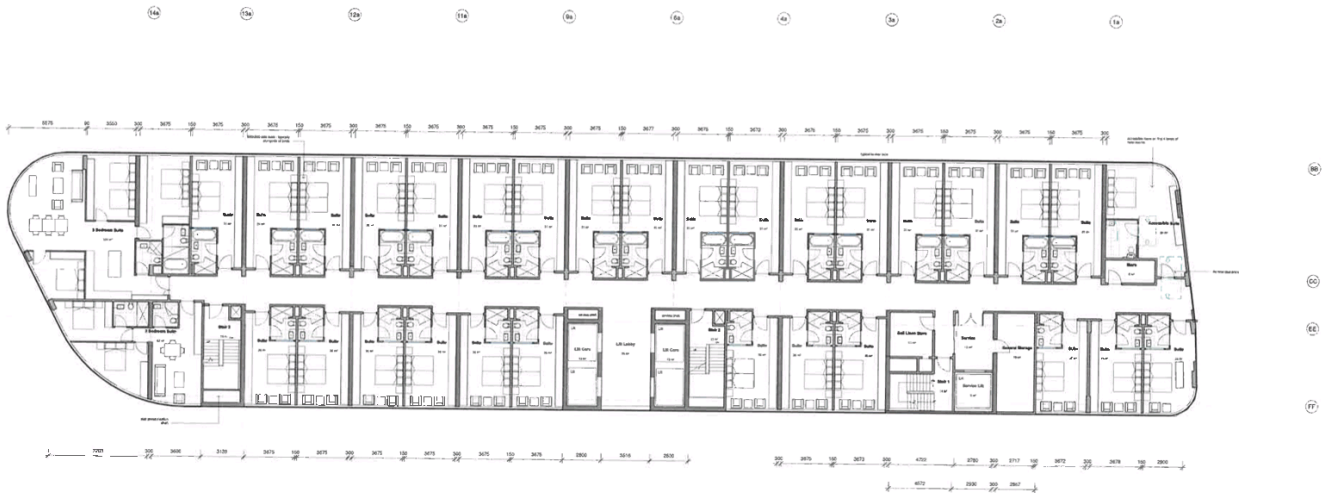

4th Floor Car Park Rooms
Name
Area
Stair 1 14 m²
Lift Core 8 m²
Service 11 m²
Stair 2 17 m²
Lift Lobby 25 m²
Lift Core 13 m²
Lift Core 13 m²
Stair 3 19 m²
full height mesh screen
void
Ramp Down 1:5
Turning point
1 level 4 - carpark
1 : 100



6th Pool and Wellbeing Rooms

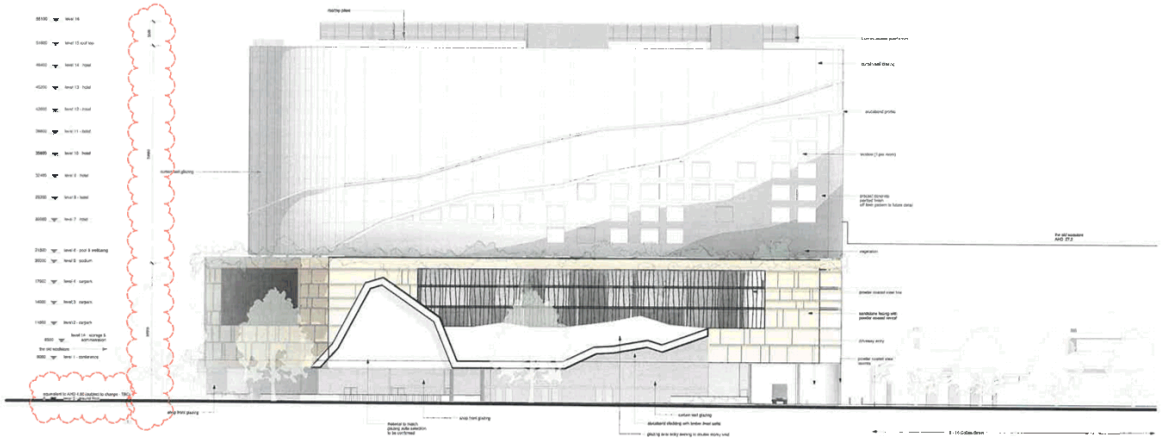
Name	Area
Stair 3	18 m²
Lift Core	13 m²
Lift Core	13 m²
Stair 2	17 m²
Gym Male toilet/ change	23 m²
Club House	87 m²
Club House Kitchen	31 m²
Pool	336 m²
Air Lock	7 m²
Male Toilets	14 m²
Male Change Room	29 m²
Lounge	99 m²
Lift Lobby	28 m²
Gymnasium	92 m²
Health Retreat	86 m²
Office	12 m²
Medical Room	34 m²
Treatment Room	48 m²
Treatment Room	24 m²
WC	6 m²
Staff Rest Male	18 m²
Staff Back of House	73 m²
Male Bathroom	17 m²
Lndry	7 m²
Female Bathroom	16 m²
Staff Rest Female	20 m²
Male Steam	11 m²
Male Sauna	11 m²
Female Change Room	33 m²
Female Steam	12 m²
Female Sauna	10 m²
Female Toilets	13 m²
Unisex Disability Accessible Toilet and Shower	10 m²
Gym Female toilet/ change	22 m²

1 level 6 - pool & wellbeing
1 : 100

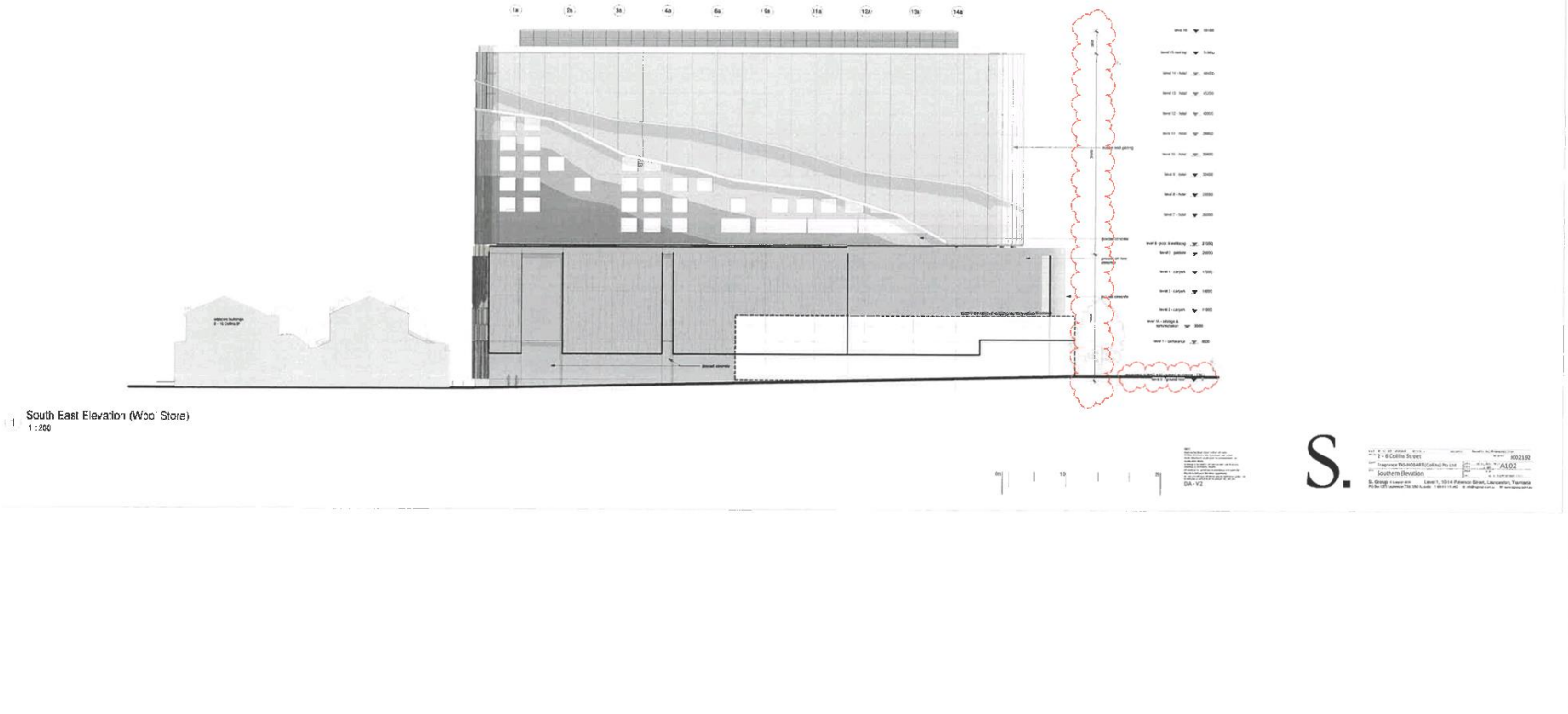


Hotel Suite Rooms	
Name	Area
Stair 3	16 m²
Lift Core	13 m²
Lift Core	13 m²
Stair 2	17 m²
Stair 1	14 m²
Service Lift	6 m²
General Storage	19 m²
Soil Linen Store	11 m²
Suite	26 m²
Suite	25 m²
Suite	25 m²
Suite	25 m²
Suite	25 m²
Store	6 m²
Suite	24 m²
Accessible Suite	39 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
3 Bedroom Suite	124 m²
2 Bedroom Suite	63 m²
Suite	26 m²
Suite	26 m²
Suite	26 m²
Suite	26 m²
Suite	26 m²
Lift Lobby	25 m²
Suite	28 m²
Service	11 m²

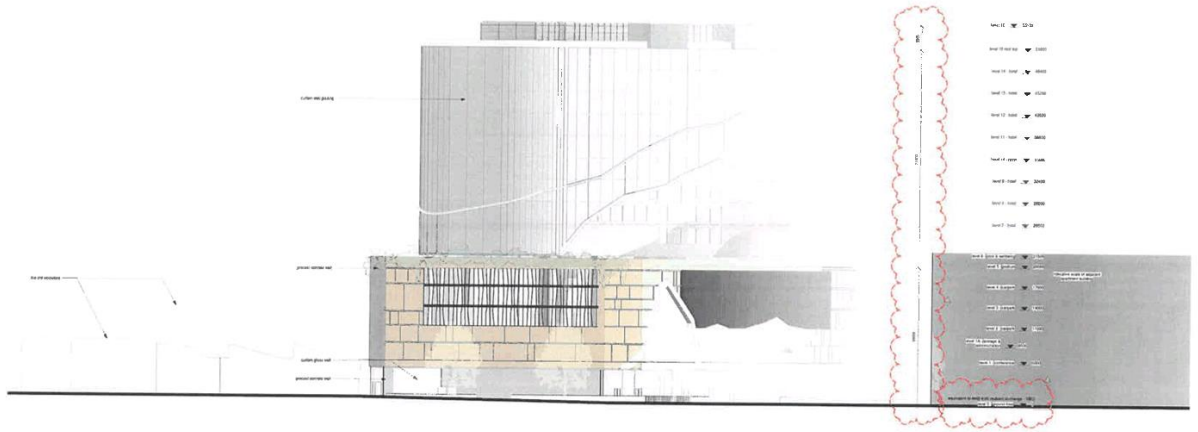
1 7th - 14th Floor - Hotel
1 : 100



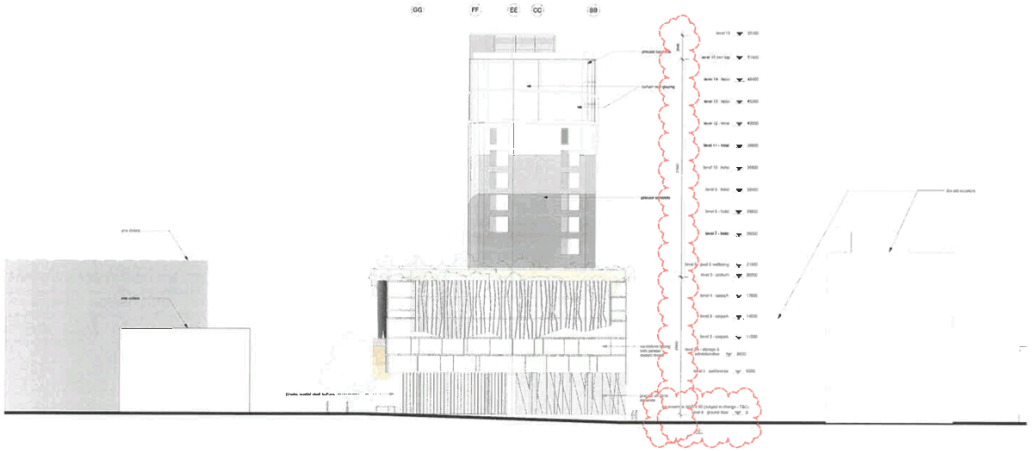
1 Collins Street Elevation
1 : 200



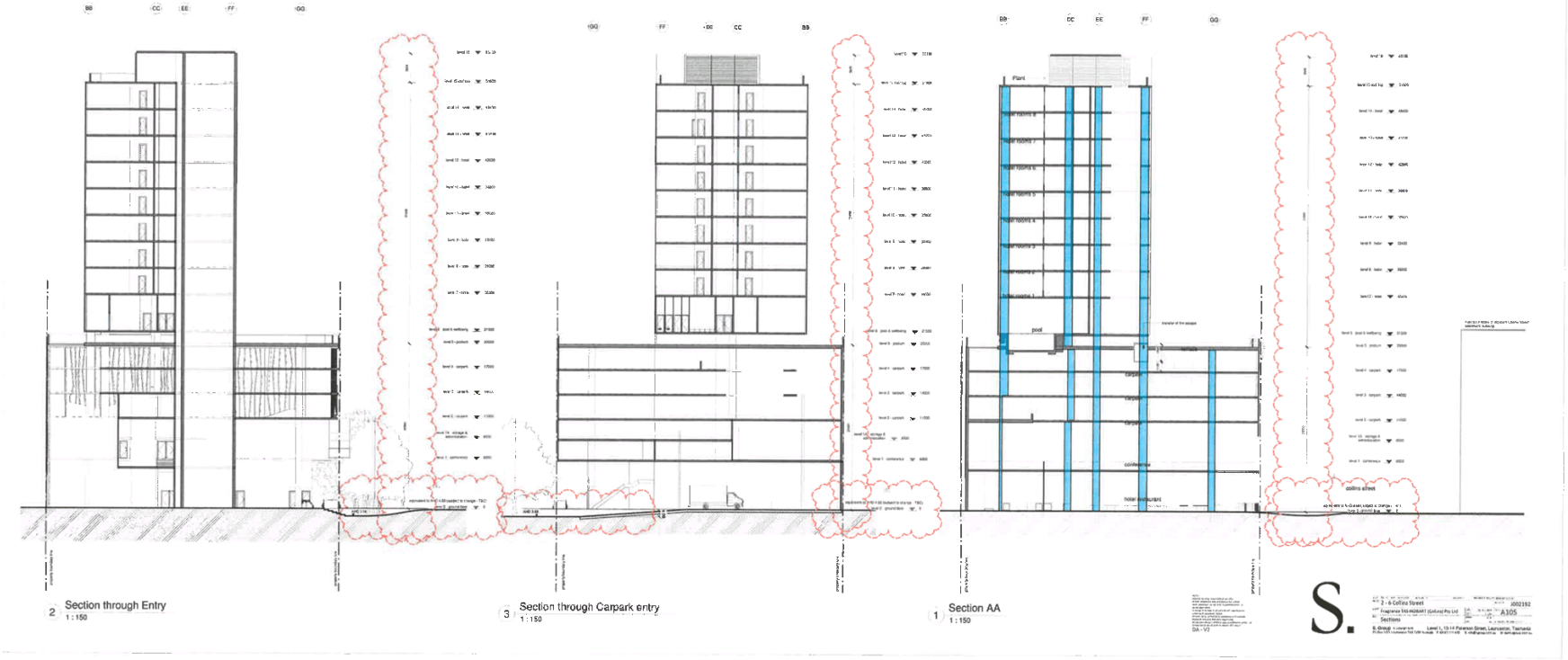
1 South East Elevation (Wool Store)
1 : 200



1 Brooker Street Elevation
1 : 200



1 Ragged Lane Elevation
1 : 200


Section through Entry
1 : 150
Section through Carpark entry
1 : 150
Section AA
1 : 150
Plant
pool
cargark
commercial
hotel restaurant
collins street

* cast shadows generated by HDC from BIM model

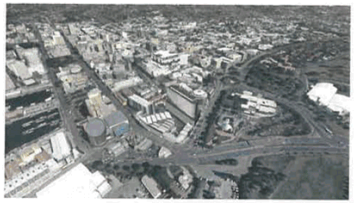
S.

2 - 6 Collins Street

Shadow Diagrams

A200











*3 dimensional context model generated by HCC from IQVI model

DA - V2

S.

2 - 6 Collins Street

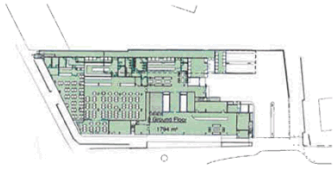
Fragrance TAS HOBART (Collins) Pty Ltd

Context Modelling

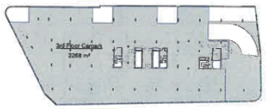
J002192

A201

S. Group

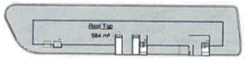


1 level 0 - ground floor
1 : 500



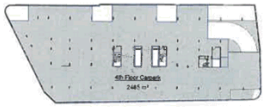
4 level 3 - carpark
1 : 500

8 level 6 - pool & wellbeing
1 : 500

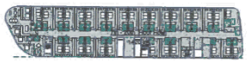


10 level 15 roof top
1 : 500

2 level 1 - conference
1 : 500



5 level 4 - carpark
1 : 500



7 level 7 - 14 - hotel
1 : 500

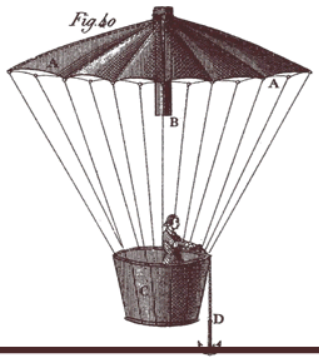
Area Schedule (Gross Building)

Level	Area
level 0 - ground floor	1794 m²
level 1 - conference	2302 m²
level 2 - carpark	2047 m²
level 3 - carpark	2268 m²
level 4 - carpark	2485 m²
level 6 - pool & wellbeing	1428 m²
level 7 - hotel	1420 m²
level 8 - hotel	1420 m²
level 9 - hotel	1420 m²
level 10 - hotel	1420 m²
level 11 - hotel	1420 m²
level 12 - hotel	1420 m²
level 13 - hotel	1420 m²
level 14 - hotel	1420 m²
level 15 roof top	584 m²
Grand total: 15	24270 m²

3 level 2 - carpark
1 : 500

S.

GANDY AND ROBERTS
159 DAVEY ST
HOBART TASMANIA
AUSTRALIA 7000
CONSULTING ENGINEERS



Structural Specification

Collins Street Hotel

2-6 Collins Street

for S Group

May 2018

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PROJECT NUMBER **16.0253**
AUTHOR Adam Richards
CHECKED BY -

Gandy and Roberts Consulting Engineers

STRUCTURAL CIVIL HYDRAULICS

ph (03) 6223 8877
fx (03) 6223 7183
mail@gandyandroberts.com.au
159 Davey Street Hobart, Tasmania 7000
www.gandyandroberts.com.au

Version control

Revision	Description	Issue date	Issued by
1	Concept design (pre DA)	12.09.16	AR
2	Concept design (pre DA)	18.10.16	AR
3	Concept design (pre DA) – revised architectural scheme	16.03.17	AR
4	Concept design (pre DA) – columns in and around Stair 3 and lift shaft relocated	17.03.17	AR
5	Concept design (pre DA)	28.02.18	AR
6	Concept design (pre DA)	15.03.18	AR
7	Concept design (pre DA) – drawing backgrounds updated	31.05.18	AR
8	Concept design (pre DA) – drawing backgrounds updated	03.07.18	AR

1 Project description

The project consists of a 15 storey hotel in lower Collins Street, comprising eight levels of hotel rooms, three levels of suspended carpark and four levels of mixed use space for hotel guests and the public.

Gandy & Roberts' involvement to date has been limited to providing a partial structural and hydraulic scheme and hydraulic concept servicing documentation during the pre-development application stage. The structural scope has been limited to determining an efficient vertical load path through the building taking into account the architectural and functional constraints imposed upon it. Preliminary sizing of hotel levels slabs, beams and columns has been undertaken to test the available structural space, and ensure that the zones provided by the architect are sufficient. Transfer structures have been sized based on a preliminary load rundown of selected columns. Stability has not been assessed at this stage. The core arrangement is reasonably central within the building, and it is anticipated that with suitably sized concrete walls, and tension piles if required sufficient lateral stiffness can be achieved.

2 Briefing information & Design inputs

The following information has been used to inform the structural design.

2.1 Building uses

Location	*Function*	*Comments*
L00	Public reception, dining spaces & back of house	
L01	Conference facilities	
L01A	Administration & storage	
L02-L04	Carpark	
L05/ L06	Podium Level (open terrace), Guest amenities (Pool & wellbeing centre)	
L07-L14	Hotel accommodation	

2.2 BCA Classifications

Classification	*Location & extent*	*Comments*
TBA		

Building Importance Level = TBA

2.3 Fire Rating Levels

Element	*FRL*	*Comments*
GL-L01	180/180/180	TBC by building surveyor – assumption based on similar projects
L02-L04	120/120/120	"
L05-L20	90/90/90	"

2.4 Construction Sequence

Element	*Location*	*Comments*
TBC		Tower crane assumed to be located centrally within hotel lobby

2.5 Architectural considerations

2.5.1 Floor finishes

2.5.1.1 Polished concrete

No allowance has been made for increased crack control of structural concrete, or provision of non-structural screeds to accommodate polished concrete floors. Crack control of restrained concrete cannot be guaranteed. Polished concrete floor proposals should be submitted to the Gandy and Roberts for review and comment prior to construction.

2.5.1.2 Setdowns

50mm setdowns have been assumed for ensuites, bathrooms, other wet areas. Infill screeds are non-structural items, and are not covered within the structural scope.

2.5.2 Expansion joints and deflections

Expansion joints (if required) will be shown on the drawings. Architectural detailing of non-structural walls and floor finishes which bridge expansion joint locations needs to include corresponding expansion joints in these locations. Selection of expansion joint covers is by the architect – expected range of movement can be provided to assist with selection.

Design deflection limits are as per the table below. Architectural detailing of façade elements, non-loadbearing and operable walls, glazing systems etc. need to take these into account. Deflection figures for specific locations can be provided to assist with detailing.

2.5.3 Fire rating

Concrete elements will be designed to accommodate the required FRL, however steel framing elements have no inherent rating. They require protection to achieve the required fire rating via external finish or cladding (ie. intumescent paint, fire rated plaster etc.).

3 Structural design

3.1 Structural System

The building will be constructed using the following structural systems:

Element	*Systems*	*Comments*
Footings	Large diameter bored piles and pile caps/ground beams	
Retention	None required	
Columns	Insitu and/or precast concrete	
Walls	Precast concrete	
Floors	Insitu post tensioned concrete	
Roof	Insitu post tensioned concrete or steel frame and sheet	
Stability	Concrete lift and stair cores with compression and tension piles.	

3.2 Loads

3.2.1 Vertical

Description	*Location*	*DL*	*ADL*	*IL*	*Comments*	*Source*
Floors	L00-L01	SW	1.0 kPa	4.0 kPa		AS1170.1
	L02-L04	SW	0.5 kPa	2.5 kPa		AS1170.1
	L05	SW	5.5 kPa	5.0 kPa	ADL assumes falls and ballast	GR assumption
	L06 (general)	SW	1.0 kPa	5.0kPa	IL based on gymnasium loading	AS1170.1
	L06 (pool)	SW	17kPa	5.0kPa	ADL based on 1.2m deep pool	GR assumption
	L07-L20	SW	1.0kPa	2.0kPa		AS1170.1
Facade	All levels	-	6.0 kN/m	-		GR assumption
Construction	...	-	-	3.0 kPa	Backprop through two levels	GR assumption
Roof		0.5 kPa	0.5kPa	0.25 kPa	Steel frame and sheet roof	GR assumption

3.2.2 Wind

Annual probability of exceedance =	1/500 years
Wind Region =	A3
Regional Wind Speed	Vu = 45 m/s
	Vs = 37 m/s
Terrain Category =	3.0

3.2.3 Seismic

Annual probability of exceedance =	1/1000 years
Probability factor (kp) =	1.3
Hazard factor (Z) =	0.03
Site subsoil classification =	Ce
Earthquake Design Category (EDC) =	III
Structural system =	Ductile shear walls
Ductility factor (μ) =	3
Structural performance factor (Sp) =	0.67

3.3 Deflections

The following deflection limits will apply to the building:

Element	*Location*	*Condition*	*Limit*	*Comments*
Floor slabs	All levels	Long term total	Span/300 (30mm max)	
Transfers	All levels	Long term total	Span/750 to Span/1000 (10-15mm max)	

3.4 Vibration

No specific requirements.

3.5 Acoustics

No specific requirements affecting the structural design.

4 Geotechnical Investigation

A desktop study of the site was undertaken by Scherzic for the former owner. Extracts of the report can be found in Appendix A.

5 Design documentation

A series of sketches have been developed to define the vertical load path through the building and to assist the architect with their spatial planning. Piling zones have also been identified to inform the proposed archaeological investigation. Copies of these documents can be found in Appendix B.

Note that this set of sketches incorporates significant changes made to the building since the previous revision of the structural specification.

Although strictly speaking not applicable to the structural specification, hydraulic concept servicing plans have also been included in Appendix B.

6 Safety in Design

A design safety report for this project will be prepared as the design develops.

7 Certification for Building Approval

Structural certification in accordance with the Tasmanian Building Act will be provided at the completion of the design and documentation phases.

8 Contractor's responsibilities

8.1 Building permit

The Contractor will be responsible for ensuring that a valid building permit is in place for the work and that the Building Surveyor is notified of all structural site inspection requests.

8.2 Construction inspections

At all nominated hold points, the Contractor is responsible for requesting the relevant parties to attend the site and inspect the work. The work shall be complete at the time of the inspection. A minimum of 24 hours notice is required for Gandy and Roberts to attend the site. Do not rely upon facsimile or email to communicate requests - make contact with our office to confirm attendance. Photographic documentation is not an adequate basis to proceed beyond a hold point unless approved by Gandy and Roberts.

Release of hold points can only be authorised by the Building Surveyor and/or Superintendent. As designing engineer, Gandy and Roberts does not have any contractual or statutory authority to do so. Gandy and Roberts attends the site to check for compliance with the design intent only, and we will not inspect the work unless a valid building permit has been issued by the relevant authority.

8.3 Temporary works

The Contractor will be required to carry out all temporary works necessary to enable completion of the structure (including the engagement of suitably qualified designers, and is responsible for all associated costs), this includes (but is not limited to) the following:

- Underpinning
- Precast panel propping
- Formwork
- Scaffolding
- Shoring
- Assessment of floors/roofs carrying construction loads in excess of the design load
- Backpropping of suspended slabs

The contractor should ensure that their proposed methods of work are available to Gandy and Roberts upon request for review.

8.4 Work Health and Safety

The Contractor shall comply with the State *Work Health and Safety Act, Regulations* and all relevant codes of practice.

The Gandy and Roberts Design Safety Report (refer to Section 5 above) forms an integral part of the project documentation. The report identifies safety risks and proposes control measures to be followed by the Contractor and the Building Operator. Controls and hazards requiring more explanation than in the safety report are highlighted in our drawings with an exclamation mark in a triangle symbol.

Should the Contractor identify omissions or errors in the report related to the scope of Gandy and Roberts' work on the project please contact us.

9 Building Specification

9.1 General

The following specification sections will be prepared prior to tender for the purposes of describing the structural requirements of the relevant building components only. Additional requirements may be found within the architectural specification.

9.2 Specification sections

It is anticipated that the following specification sections will be required for this project:

Footing Systems
- 0301 Piling
- 0302 Spread footings

Concrete
- 0310 Concrete (combined)
- 0313 Post tensioned concrete
- 0317 Tilt-up concrete

Steel
- 0341 Structural Steel

Masonry
- 0331 Brick and block construction

Appendix A

Geotechnical Report

Scherzic

Ground Investigations

10 October 2014

Our ref: 7116A

Your ref:

FAIRBROTHER Pty Ltd
12 Stony Rise, DEVONPORT 7310
Attention: Paul Ransley/Simon Dunne

GEOTECHNICAL REVIEW
2 Collins Street, Hobart

1 Introduction

Fairbrother Pty Ltd are proposing to redevelop the above site which could include the following scope of works:

- Demolition of the existing building/s excluding the heritage listed wall on the north-west boundary
- Underground car park (nominal 3.5m excavation)
- 2-3 floors of new commercial tenancies (podium levels)
- Residential / Commercial tower on top of the proposed podium (up to 8 levels)

A copy of the site title is given in Appendix A with the site identified as S.P.2943 which covers an area of 3009m2. **Figure 1** below shows a view of the site from the Brooker Highway.

Figure 1 View from Brooker Highway

A walkover of the site was undertaken and photographs taken to record salient features. The inspection indicates the site appears to be located in a low lying area (no contours available) and there is efflorescence in lower brickwork in Ragged Lane. Also, obvious to the site is the re-routed Hobart Rivulet which runs under the other side of Collins Street. All this visual evidence supports the conclusion

Scherzic Pty. Ltd. A.B.N 99 167 712 325
P.O. Box 33, Sandy Bay, Tasmania, 7006
Mobile 0418 385 983
E-MAIL: info@scherzic.com

Scherzic
Ground Investigations

that drainage of the site is problematic and ground water below near surface level will be present for many months of the year if not permanently.

2 Geological Background

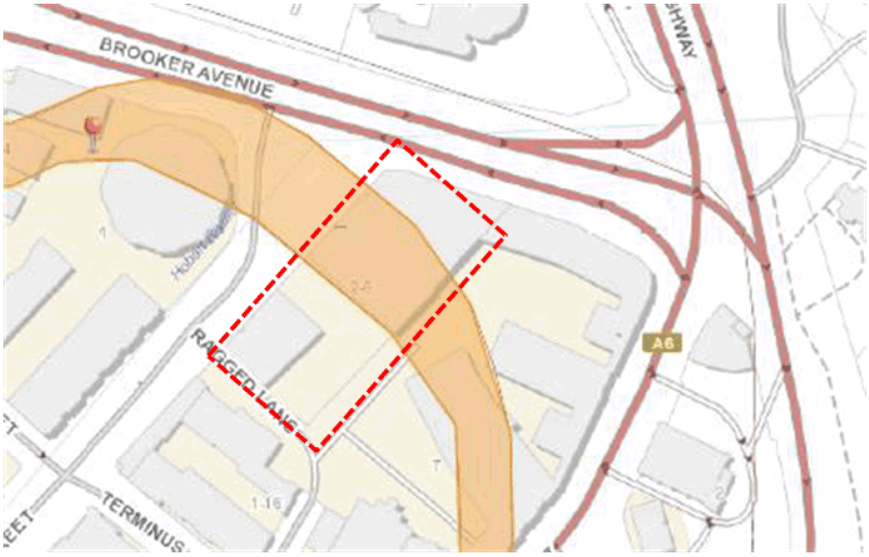


Figure 2 - The List Geology

The ListMap of the site identifies an area of surface filling runs through the site which is shown in Figure 2 above.

The geological map of Hobart, scale: 1:25,000, 2010, which is reproduced in Figure 3 below also confirms the segment of filling running through the site. The description of the surface geologies in the map are:

Qa-Quaternary Alluvium (gravel, sand, clay)

Qhmm-Quaternary Man Made Deposits

Qi-Undifferentiated Bay, Estuarine, Deltaic & Alluvial Deposits (sand, gravel, boulders, silt, clay)

Rqph-Triassic Sandstone/Siltstone

Jd-Jurassic Dolerite

Scherzic
Ground Investigations

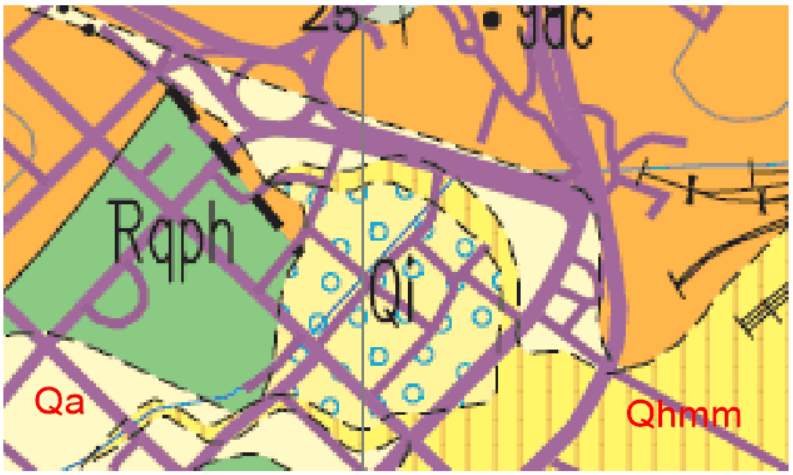


Figure 3 Excerpt of Geology Map

3 Historical Information

David Visentin from Gandy & Roberts provided historical maps and previous geotechnical information surrounding the site. The information reviewed included the 'Jarman' map of Hobart Town, CIRCA 1827 which shows the route of the former 'Newtown Rivulet' passing through the site where geological maps show man-made deposits. The location of this watercourse indicates a scar exists below surface and the original surface slopes toward this watercourse and hence fill soils will be deepest through this route.

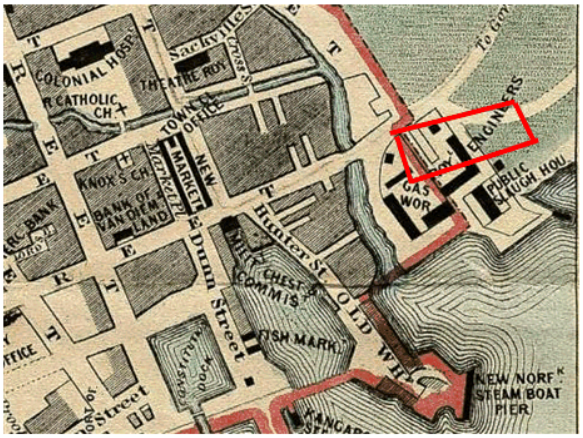
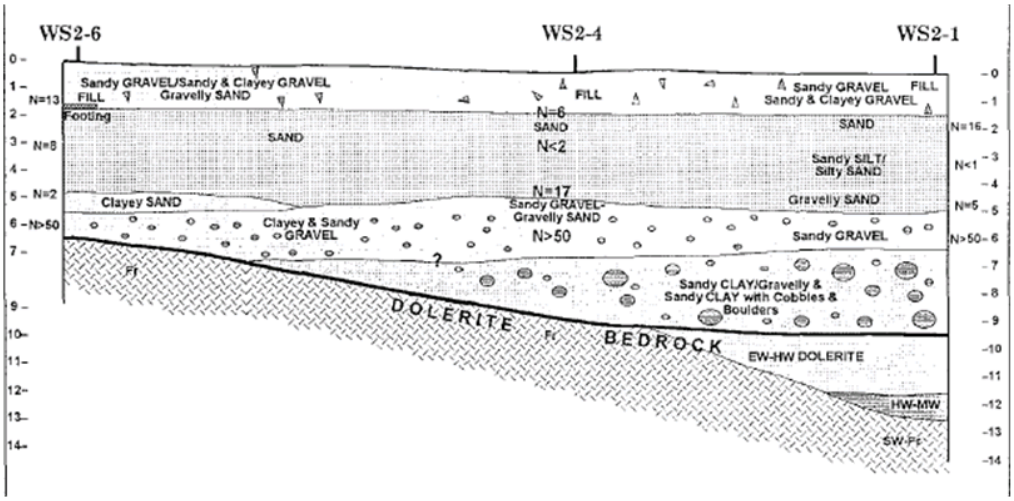


Figure 4 Jarman Map of Hobart Town

Scherzic
Ground Investigations

4 Previous Reports

A report undertaken by Sloane Weldon for the Old Woolstore Buildings in 1999 included a borehole a short distance south east of this site (WS2-6) and a cross section toward Macquarie Street in reproduced below:



This cross section indicates up to 1.5m of filling can be anticipated to the east of 2 Collins Street, which could overlie loose, wet sands with competent rock at below 6.5m depth. This cross section does not traverse the former water course and deeper filling can be anticipated in the former water course passing through the site.

5 Ground Water

As shown above, the existing route of the Hobart Rivulet runs near to the site on the western side of Collins Street and angles across the Brooker Highway toward the River Derwent so some overflows during intense rainfall event scan be expected as the site is low lying..

In addition, as shown above, the former water course of the 'Newtown Creek' runs near east-west through the site and the subsequent fill soils are expected to act as a sump for ground water flows in the vicinity of the site. The Sloane Weldon (1999) report found ground water toward Macquarie Street at 2.2m depth. The measured pH was 7.3 which is near neutral so no special treatment of concrete is anticipated.

6 Conclusions and Recommended Investigations

Based on the information presented above, the following subsurface conditions are anticipated over the site:

1. A former 'creek' runs through the site which is backfilled with fill soils. The entire site is likely to have some filling over natural soils
2. The fill soils will be saturated below 2m depth but the ground water depth will vary according to rainfall events

Scherzic
Ground Investigations

3. The natural soils under the filling are likely to be loose saturated sands prone to liquefaction under seismic loads
4. Gravels, with cobbles and boulders in a sand or clay matrix will exist beneath the sands which have variable properties (problematic for driven piles)
5. Competent Dolerite Rock exists below 6.5m depth.

Given the above, a geotechnical investigation should be undertaken to quantify the fluctuations in ground water, the conductivity of the foundations to 4m depth, and the density/strength of the natural sands. In addition the investigation should provide an estimation of depths of gravels/cobbles/boulders and depth to competent Dolerite. As there is filling of unknown origin and potentially a basement will require removal of the filling from the site, a preliminary assessment (sampling) of any potential soil or water contaminants is recommended during the site investigation. Normally a Preliminary Environmental Assessment is undertaken before any sampling but this can be deferred until more understanding of the development is known.

Although not apparent, it may be prudent to review any subsurface heritage/archaeological requirements for the development. If this is required we recommend a review of the geotechnical investigation methodology which could be revised to include Geophysical methods such as Electromagnetics or Ground Penetrating Radar. An investigation of the footings supporting the heritage wall may be prudent with any archaeological assessment.

the LIST.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmania
Explore the possibilities

OWNER Roberts Limited

FOLIO REFERENCE C.T. 64636-2, C.T. 33036-1
C.T. 249136-1, C.T. 121603-1000

GRANTEE Whole of 0A 1R 3P, Gtd to R.A. Roberts, Part of 0A 2R 5P, Gtd to George & Margaret Scrimgeour, Whole of 0A 0R 5½P, Gtd to Jane Scringer, Whole of Lot 2 0A 0R 11¼/10P & Lot 3 0A 0R 17/10P, Gtd to Henry Martin, Part of Lot 1, Gtd to Patrick Martin, Part of Lot 4, Granted to Samuel Wells Roberts, Part of 0A 2R 2P, Gtd to Joshua Fergusson, Part of 0A 1R 20P, Granted to Mary Facy, Part of allotment vested in the City Council

PLAN OF SURVEY

BY SURVEYOR A.M. Peacock of PEACOCK, DARCEY & ANDERSON P/L AUTHORISED SURVEYORS
LOCATION 127 BATHURST STREET - HOBART

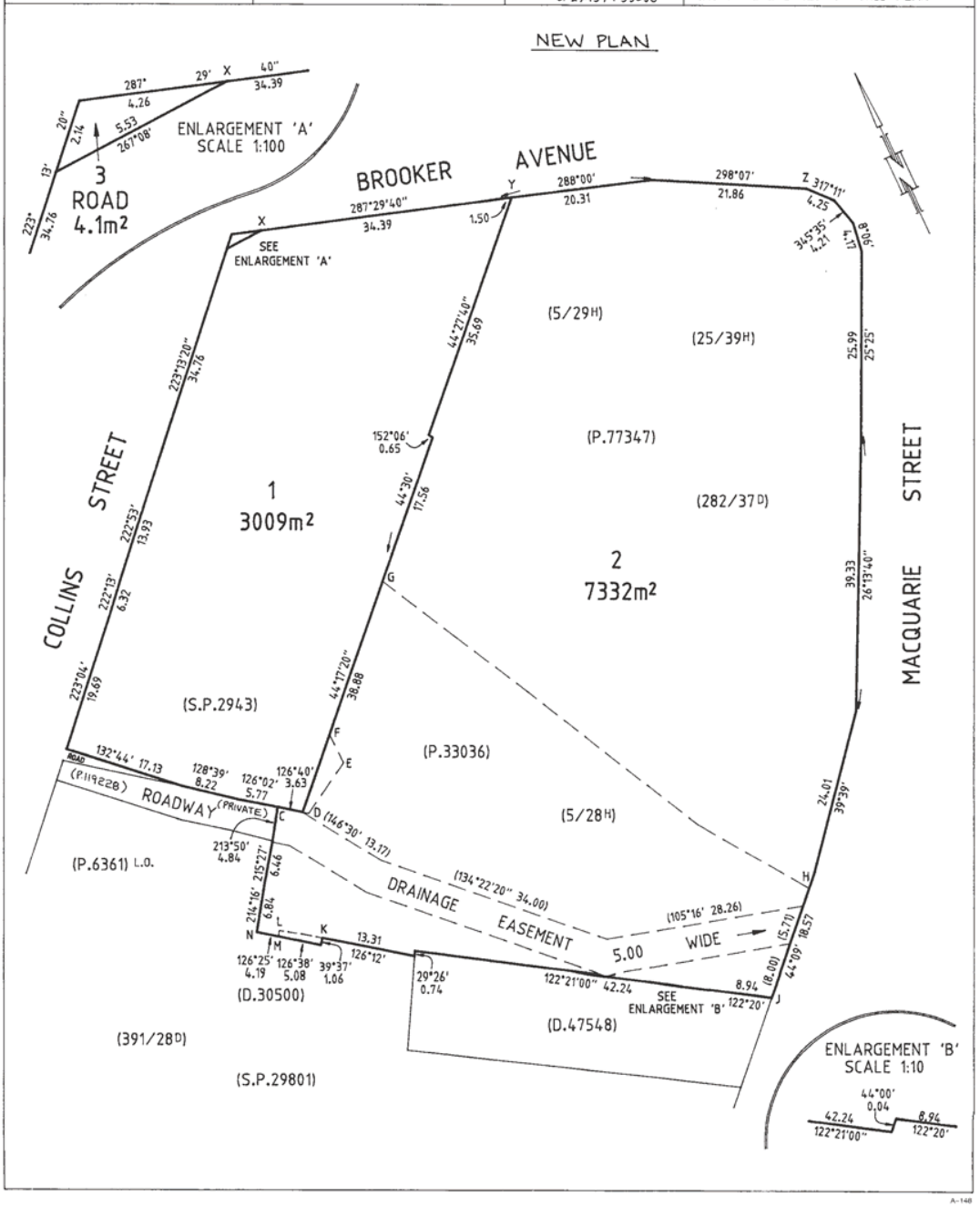
CITY OF HOBART

SCALE 1: 500 LENGTHS IN METRES

Registered Number
SP121603

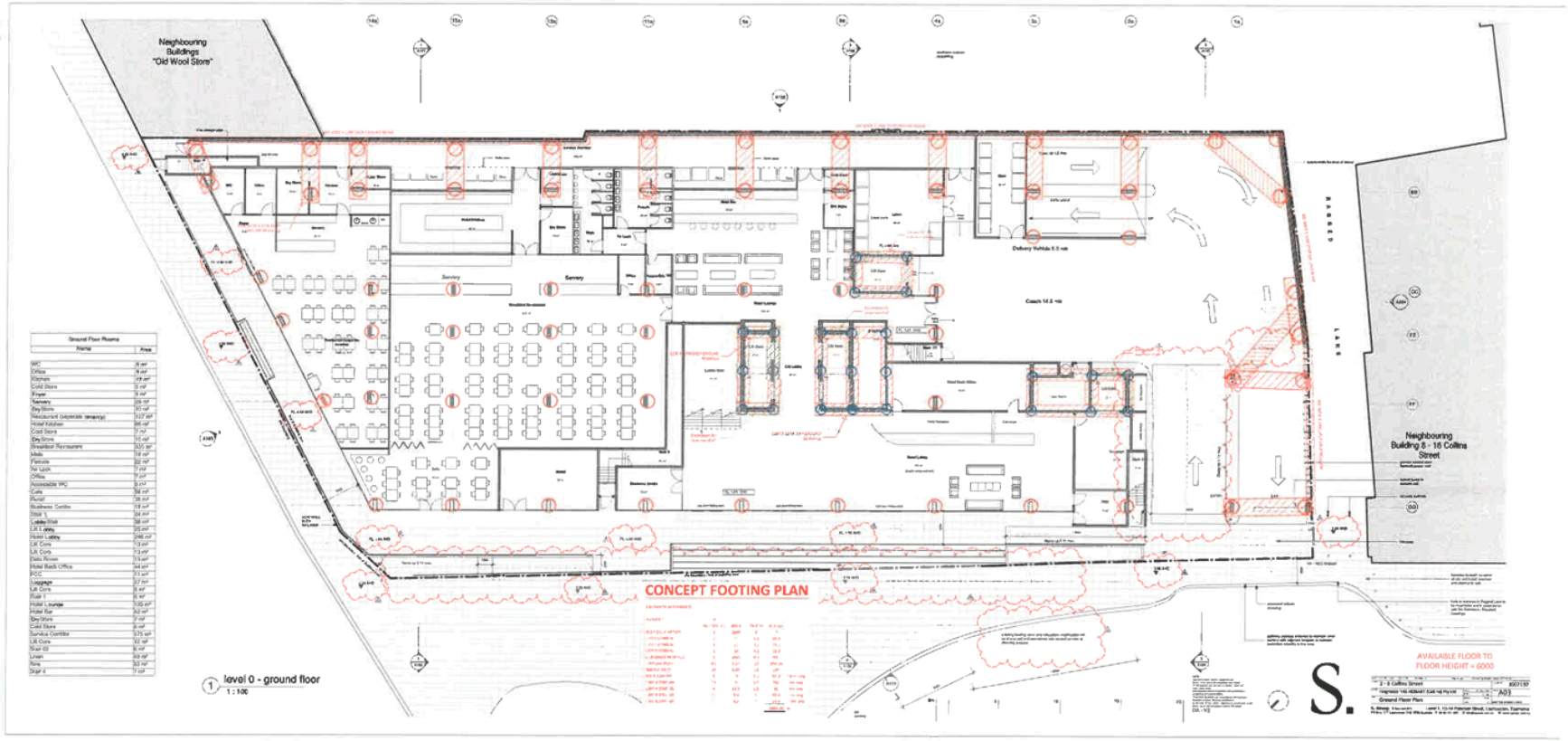
APPROVED
EFFECTIVE FROM 20 NOV 1995
Recorder of Titles

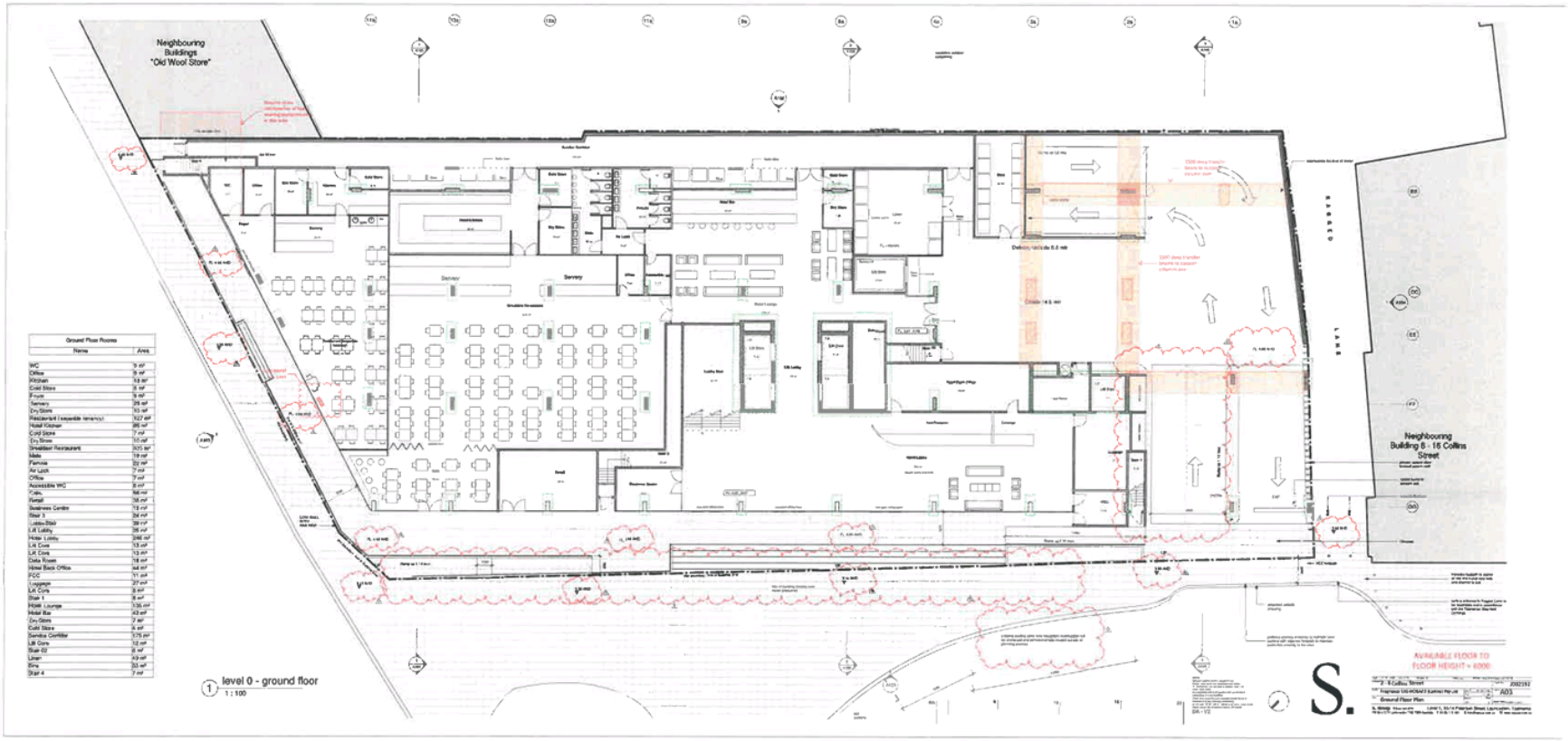
MAPSHEET MUNICIPAL CODE No.	LAST UPI No.	LAST PLAN No.	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN
114	2100060, 2100061 2100062	P249136 SP2943, P33036	



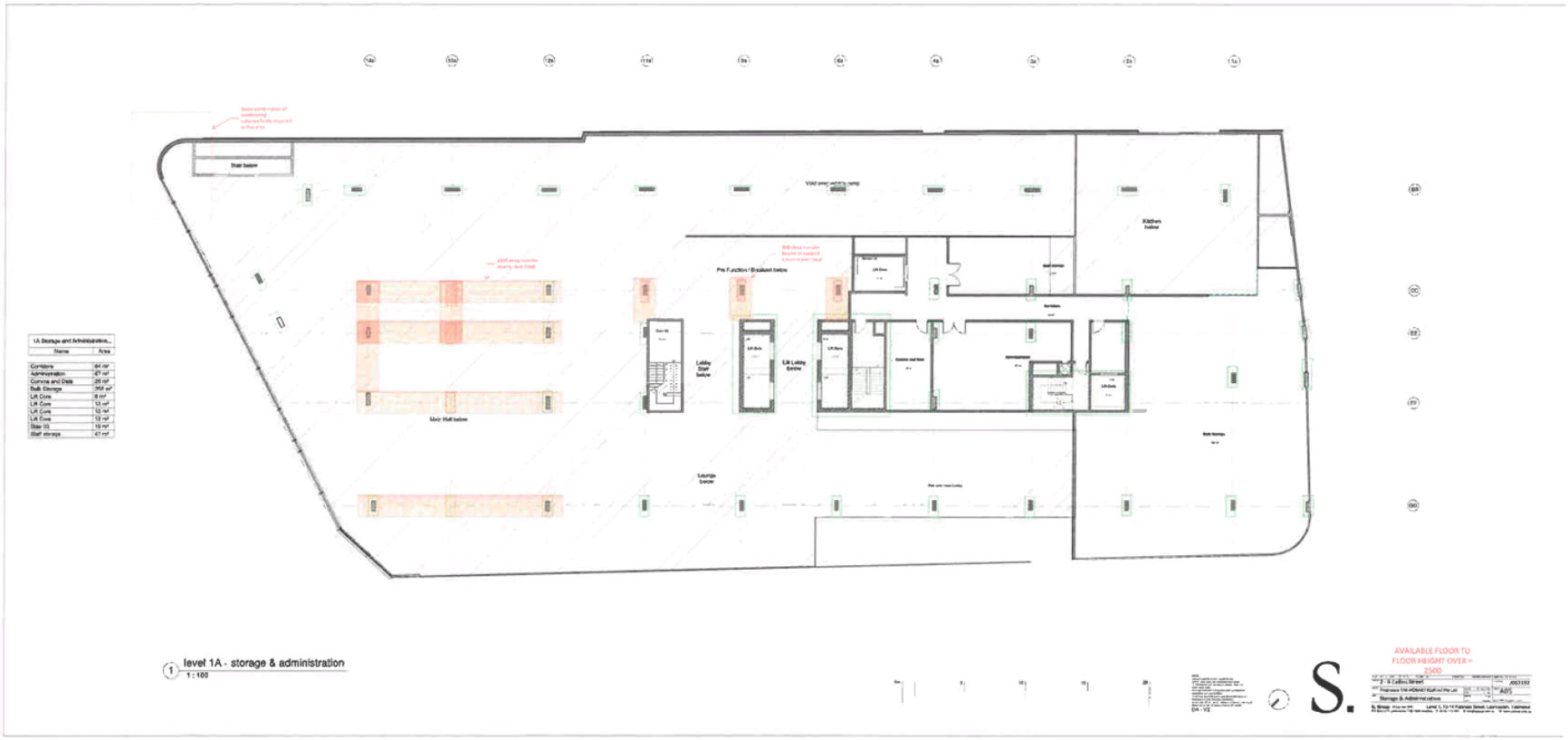
Appendix B

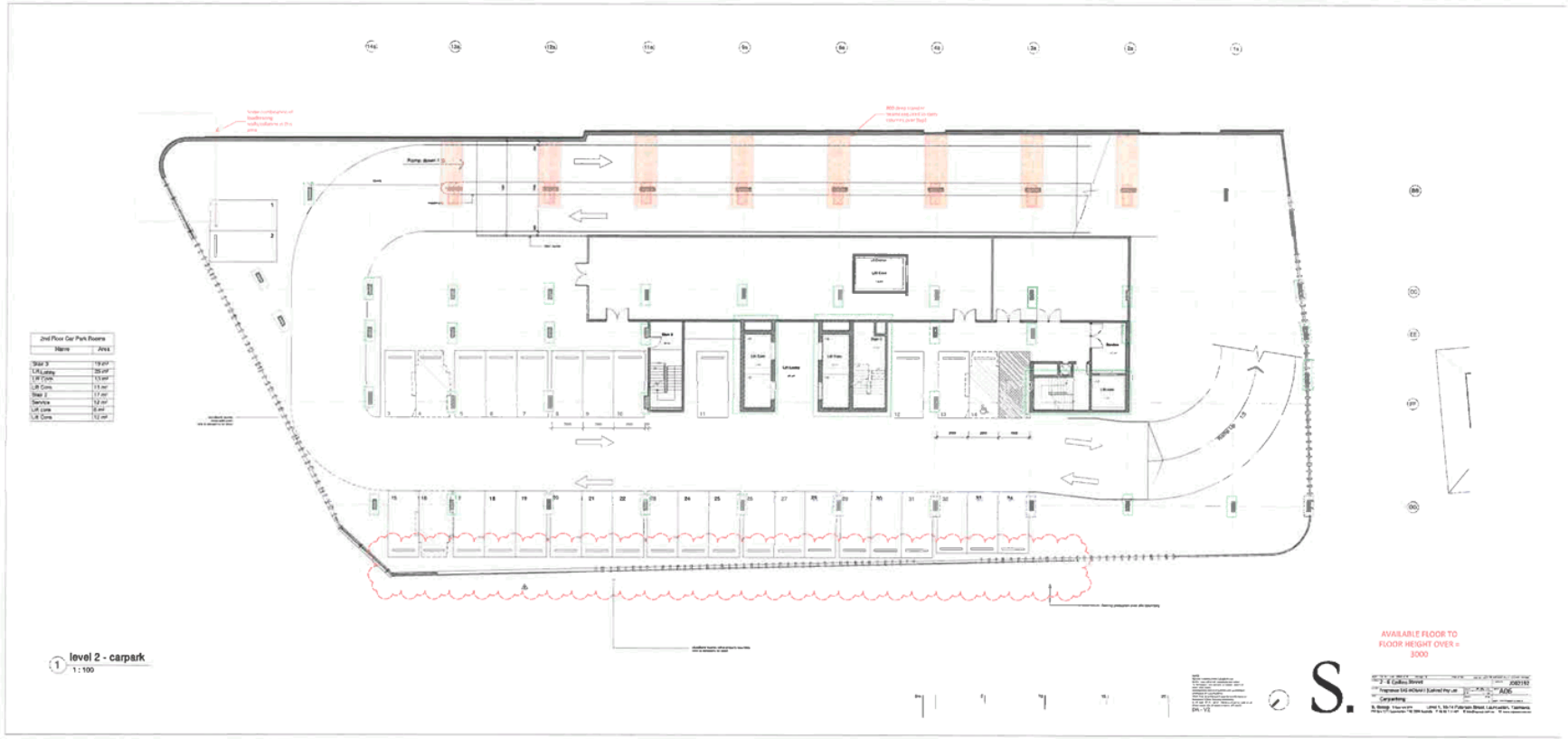
Documentation

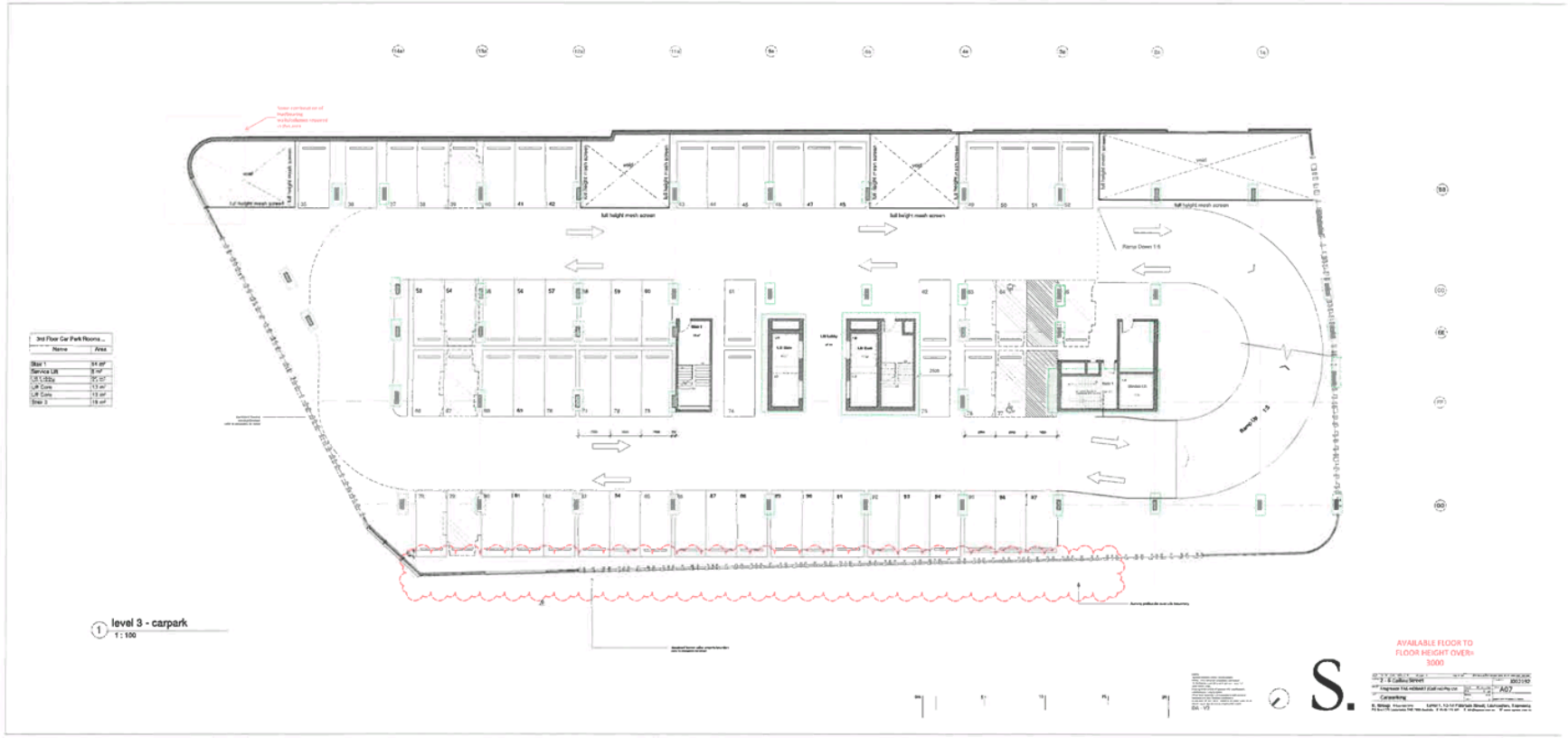

Neighbouring Buildings "Old Wool Store"
CONCEPT FOOTING PLAN
Neighbouring Building 8 - 16 Collins Street
level 0 - ground floor
1 : 100
AVAILABLE FLOOR TO FLOOR HEIGHT = 6000

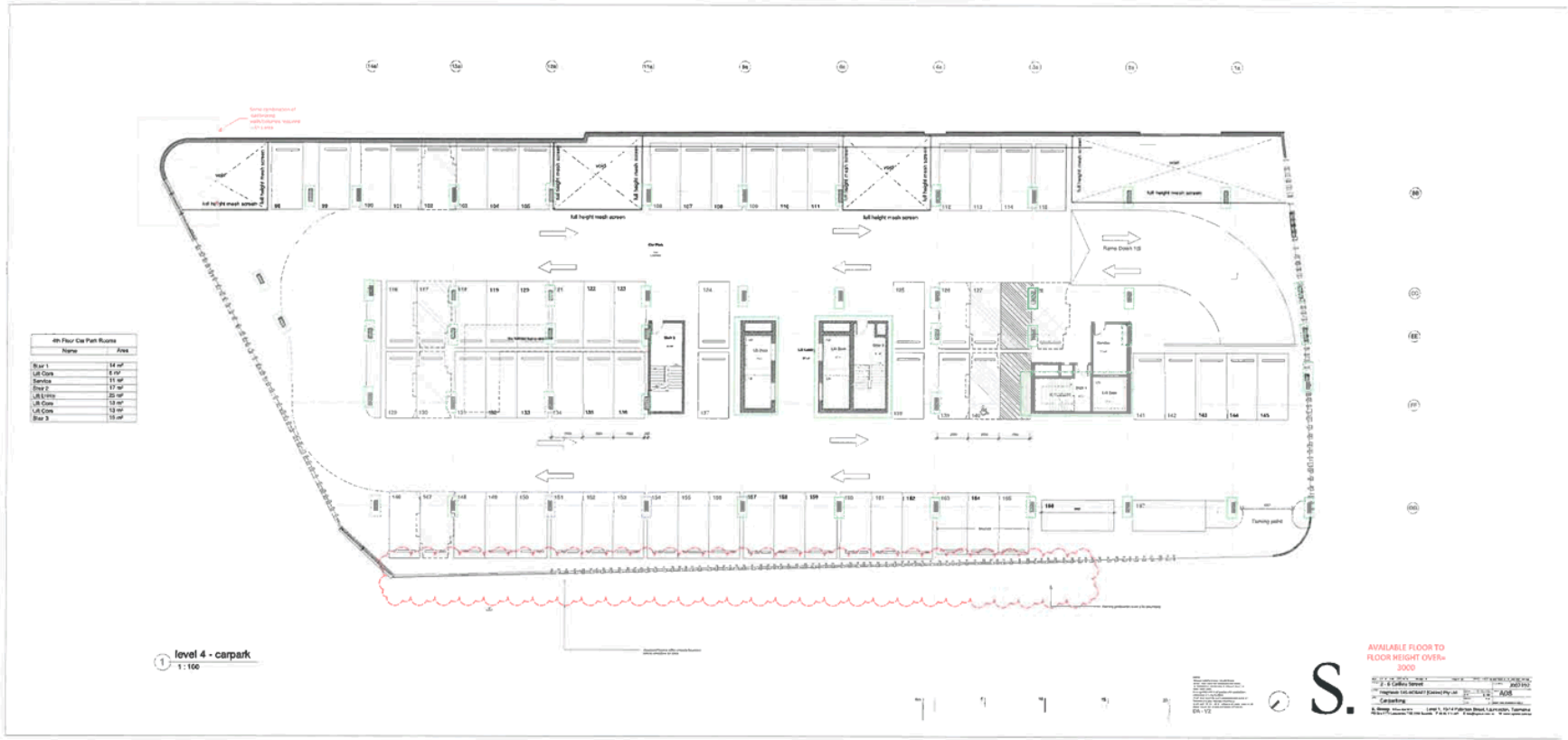

Neighbouring Buildings "Old Wool Store"
Neighbouring Building 8 - 16 Collins Street
level 0 - ground floor
1 : 100

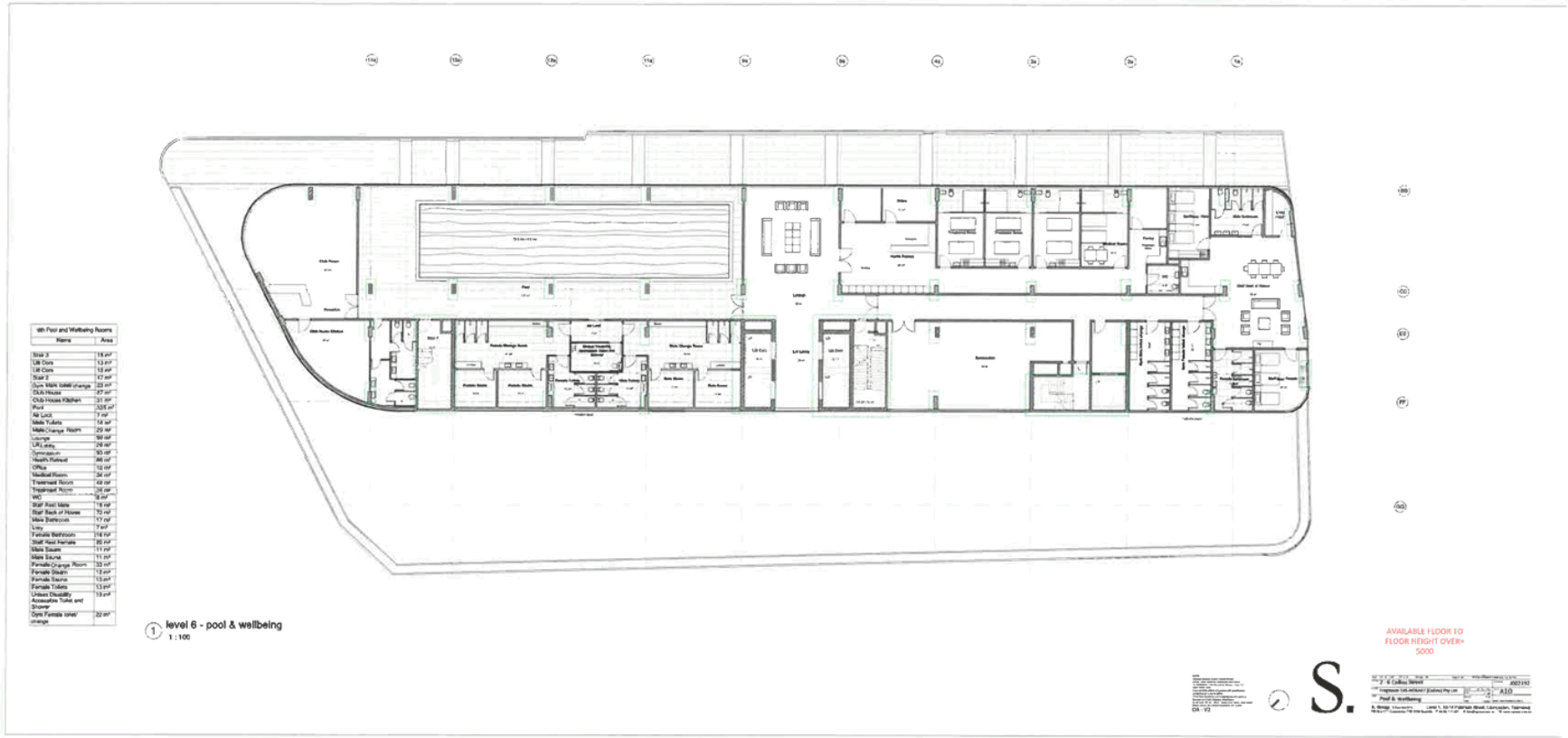

level 1 - conference
1:100
AVAILABLE FLOOR TO FLOOR HEIGHT OVER = 5000/2500

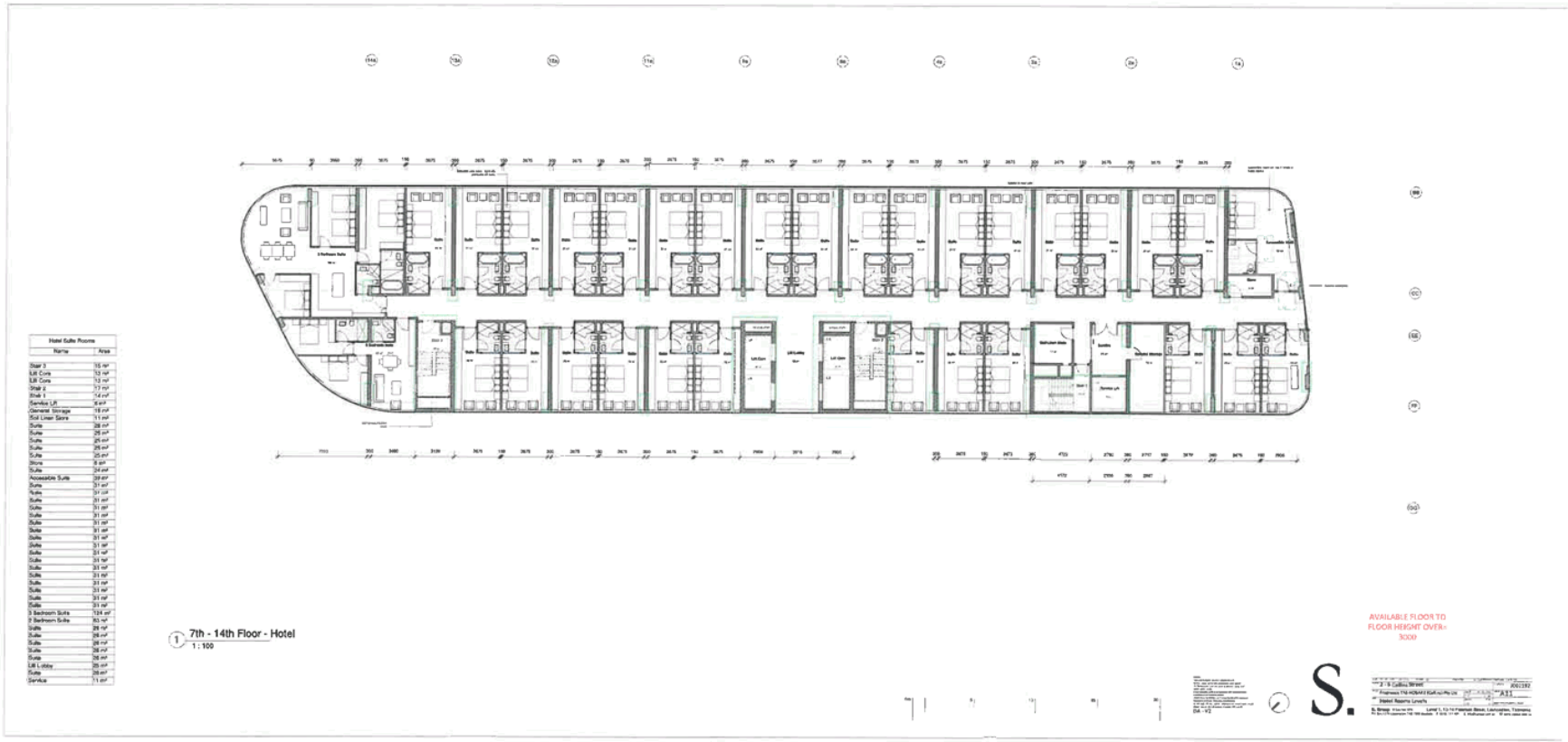

Stair below
Void over
Kitchen
below
Pre Function / Breakout below
Lobby
Staff
below
Lift Lobby
below
Main Hall below
Lounge
below
1A Storage and Administration...
Name
Area
Corridors
Administration
Comms and Data
Bulk Storage
Lift Core
Lift Core
Lift Core
Lift Core
Stair 05
Staff storage
level 1A - storage & administration
1 : 100
AVAILABLE FLOOR TO
FLOOR HEIGHT OVER =
2500


level 2 - carpark
1 : 100
AVAILABLE FLOOR TO FLOOR HEIGHT OVER = 3000


level 3 - carpark
1 : 100
AVAILABLE FLOOR TO FLOOR HEIGHT OVER= 3000


level 4 - carpark
1 : 100
AVAILABLE FLOOR TO FLOOR HEIGHT OVER= 3000


level 6 - pool & wellbeing
1 : 100
AVAILABLE FLOOR TO FLOOR HEIGHT OVER= 3000



1 7th - 14th Floor - Hotel
1 : 100

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HOBART TASMANIA
AUSTRALIA 7000
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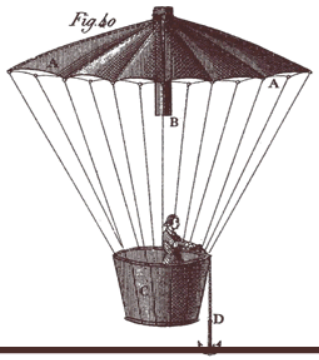

Concept Design Report

Proposed multi storey building

2-6 Collins St Hobart

for Fragrance Group

July 2018

Version control

Revision	Description	Issue date	Issued by
A	Planning Approval	13.03.18	Adam Kohl
B	Planning Approval	06.07.18	Adam Kohl

PROJECT NUMBER **16.0253**
REPORT AUTHOR **Adam Kohl**
CHECKED BY **Andrew Cupit**

Gandy and Roberts Consulting Engineers
STRUCTURAL CIVIL HYDRAULICS

ph (03) 6223 8877
fx (03) 6223 7183
mail@gandyandroberts.com.au
159 Davey Street Hobart, Tasmania 7000
www.gandyandroberts.com.au

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1 General

The project consists of 2 levels of commercial space; 3 levels of carpark; 1 level for swimming pool, spa and gym facilities; and 8 levels for hotel rooms. The site is occupied by an existing building to be demolished.

2 Civil Engineering

2.1 Sewer

The concept for the sewer is shown on drawing C010. A new DN225 sewer lot connection is proposed for the western corner of the property extending from an existing sewer manhole adjacent to the property boundary.

Sewer demand for the site is approximately 2857 fixture units with a peak minute flow of 18.1 L/s and an average daily flow of 0.91L/s based on an extrapolation of AS3500.2

2.2 Stormwater

The concept for the stormwater is shown on drawing C011. A new DN375 stormwater lot connection is proposed from the existing stormwater manhole adjacent to the NW property boundary.

Stormwater treatment prior to discharging into council mains will be provided via a “SPEL Ecoceptor” and SPEL Hydrosystem HS400.

The expected stormwater design flow for the site is Q100= 304L/s (5 minute duration).

Proposed works within Collins Street include the removal of existing kerbing and realigning with new kerbing to suit the new development. Some of the existing council infrastructure will need to be adjusted and extra infrastructure added to suit the proposed works within the road reserve (refer drawing C011).

2.3 Water

The concept for the water is shown on drawing C012. A dual DN150 water supply is intended to come off the existing DN200 water main in Collins Street. The dual water supply will service a separate pipe system for each of the fire sprinklers, and for the fire hydrant/domestic and fire hose reel demands. The water connection valves are arranged on the main to allow isolation from one direction and so to maintain flow in the case of a burst or works in the street main.

3 Hydraulic Design

3.1 Building Sewer

Connection to the Taswater sewer main will be provided by a gravity system via a DN225 boundary trap located within the property boundary.

The sewer will extend throughout the building via service risers and it is anticipated that the "Studor P.A.P.A" system will be incorporated to satisfy venting requirements.
Below ground grease arrestors to service the commercial portions of the building will be located in the laneway adjacent to the bin store behind the hotel kitchen. This location provides adequate access for cleaning and maintenance.

3.2 Building Stormwater

A siphonic stormwater system is suggested for the building, allowing smaller pipe sizes and pipe runs to be installed without grade.

The siphonic system will reticulate throughout the building via ceiling spaces and service risers.

3.3 Building Water

In order to provide an adequate water supply and pressures in a building of this height, booster pumps are required. There are a couple of options to consider with water supply;

1. Booster pumps with a minimal sized break tank. This will provide adequate water and pressure to service the building with the least cost and building footprint.
2. Booster pumps with onsite water storage. This option would consist of an additional domestic water storage tank to provide redundancy to the hotel should the water be cut off at the street.

We suggest that hot water for the hotel would be provided by a central gas hot water plant with storage tanks and reticulated throughout the building via circulating flow and return pipework located in ceiling spaces and service risers. Separate retail sections of the building would have individual electric hot water units contained within their tenancy.

Water for the fire hose reels in the commercial & retail sections of the building will be provided from the domestic supply.

4 Appendix – Concept Servicing Plans

Attached civil drawings are 1:200 at A1 scale

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING INDEX

C001 DRAWING INDEX AND NOTES
C010 CONCEPT SERVICES - SEWER
C011 CONCEPT SERVICES - STORMWATER
C012 CONCEPT SERVICES - WATER
C013 SECTION 1
C014 SECTION 2

LOCALITY PLAN
NTS

CIVIL/HYDRAULIC NOTES

GENERAL

G1. These drawing are to be read in conjunction with Architectural and Landscape Architectural drawings, Project Contract and Project Specifications. Standards referenced are to the most recent version. This page of notes over ride any engineering specifications. The following drawings over ride these notes.
G2. All works are to be done by the Contractor unless noted otherwise. Contractor must also make an allowance for works by others (eg. service connections).
G3. In these notes the Engineer refers to Gandy and Roberts.
G4. The council for this project is Hobart City Council, and they should be contacted for required inspections of public roads, public stormwater, private car parks and drives with the Engineer, and also for private building/plumbing works. The sewer and water authority is TasWater, they should be contacted for required inspections of municipal sewer and water infrastructure during construction.
G5. Locate all existing gas, electrical, telecommunications, water mains, sewer mains and stormwater mains etc. prior to the commencement of construction and advise the Engineer of anything that appears not be have been considered in the design.
G6. Confirm all levels on site prior to the commencement of works.
G7. Survey has been provided by **Survey Company**. Contractor is to allow for all set out and as constructed requirements.
G8. The contractor shall be responsible for damages caused by them or their sub-contractors, and any service, infrastructure or building damaged is to be reinstated immediately and the Engineer advised. The contractor shall conduct inspections of nearby buildings and infrastructure prior to heavy construction work starting to protect themselves from claims for damage and to provide a baseline if they have caused damage. This inspection report shall be conveyed to the Engineer within 10 working days of it being done. Construction equipment and methods need to be sensitive to ground and sound vibration prone surroundings, and contractors are responsible for consulting with neighbors, and allowances should be made in the contractor's tender and program for this. If works can't proceed without causing damage they should stop and the Engineer advised.
G9. Remove all surplus materials from site.
G10. Following agreement with the Engineer, terminate and abandon redundant existing services discovered during construction and make a note on as-constructed drawing.
G11. The Engineer is required to inspect the works at hold points on this development. A minimum of one working day of notice is required for inspections, and any results from past testing shall be made available at the time of the inspection. Hold points are at:
- setting out work and Soil and Water Management Plan implementation;
- completion of excavation for any buildings or roadwork's;
- each lift for filling;
- prior to sub-base placement;
- placement of reinforcing;
- prior to pouring kerb and channel;
- completion of base placement;
- completion of seal;
- prior to backfilling of any service trenches;
- prior to covering of plumbing in walls or roof cavities;
- completion of works.

The Engineer shall also inspect the site as he/she sees fit to ensure work is being done to the design. The Contractor shall pay for any re-inspections required due to their carelessness or failure to comply with the design or instructions, or lack of site or program organisation resulting in multiple inspections where a single inspection could have sufficed.
G12. Raw materials and constructed works need to be tested to ensure they are of suitable quality and comply with local Municipal Standards and the National Construction Code of Australia, and where not covered by these to comply with standard drawings and specifications from Tasmanian Department of Infrastructure, Energy and Resources (DIER); Water Services Association of Australia (WSAA) codes for Water (Melbourne Retail Water Agencies Edition), Sewerage and Sewerage Pumping Station (with local water and sewer authority supplements); Institute of Public Works Engineering Australia (IPEWA); and product manufacturers.
G13. On completion of works provide three sets of as-constructed drawings to AS1100.401 by a registered surveyor (measurement of building service hydraulics close to and within a permanent building can be undertaken by an experienced plumber) and full service manual along with electronic drawing files in DXF or DWG formats suitable for reading with a recent version of Autocad to the Engineer. Results of tests with associated commissioning reports and as constructed survey are required to allow the Engineer to confirm in writing to the Local Authority that construction has been substantially completed in accordance with the design drawings and are part of the works, and should form part of the service manual.
G14. It is assumed that adjacent to the development site is adequate infrastructure provided by the Local Authority and other Statutory Authorities to supply road access, water, power, telecommunications and gas as required by this design; and there is adequate infrastructure or environmental capacity to receive stormwater and sewerage drainage.
G15. Any departures from the design drawings are to be at the written approval of the Engineer, and approval from authority - except during emergencies when temporary changes can be made prior to seeking approval for a permanent change. Changes includes conflicts with existing services. Rework to make installed system comply the the design will be at the Contractor's expense.

APPROVALS

A1. The contractor is responsible for ensuring that a valid building and plumbing permit is in place for the work and that the Building Surveyor is notified of all site inspection requests. Where work is within a road reserve, a road opening permit must be obtained from local council prior to work. Workplace Standards approval must also be gained where appropriate.
A2. The contractor is responsible for organising all site inspections and observing all hold points nominated within the contract, these drawings, by the Building Surveyor, the Plumbing Surveyor and other authorities.
A3. A minimum of one working day of notice is required for the Engineer to attend the site. Do not rely upon facsimile or email to communicate requests - make contact with our office to confirm attendance.
A4. Photographic documentation is not an adequate basis to proceed beyond a hold point unless approved by the Engineer.

WORK HEALTH AND SAFETY

HS1. The main contractor and all sub contractors shall comply with the State *Work Health and Safety Act, Regulations*, and all relevant codes of practice.
HS2. The Gandy and Roberts Design Safety Report 16.0253 revision A forms an integral part of this documentation. This report identifies safety risks and proposes control measures to be followed by the contractor and the building operator. Controls and hazards requiring more explanation than in the safety report are highlighted in our drawings with an exclamation mark in the triangle symbol shown: ⚠
HS3. Should the main contractor or sub contractors identify omissions or errors in the report related to the scope of Gandy and Robert's work on the project, or have safer ways of working, they should contact Gandy and Roberts prior to construction.
HS4. Should the main contractor propose an alternative design, they need to present these with appropriate safety risk planning to Gandy and Roberts for review.

EARTHWORKS

E1. All earthworks shall be in accordance with AS3798 "Guidelines on earthworks for commercial and residential developments" with testing methods in accordance with AS1289 "Methods of testing soils for engineering purposes".
E2. All existing topsoil, vegetation and debris under the building and paved areas shall be stripped to a minimum of 300mm unless noted otherwise. Top soil to be stockpiled as directed, and vegetation and debris removed from site unless noted otherwise. Tree stumps shall be grubbed and holes filled with approved compacted fill.
E3. For excavation purposes, rock is defined as hard or strongly cemented beds or masses which cannot be ripped at a production rate exceeding 3 m³ per hour using a standard 20 tonne excavator attached with a rock breaker.
E4. Any interface between cut and fill shall be no steeper than 1V:3H. Cut horizontal benches for any fill placed on ground steeper than 1V:3H.
E5. All excavations shall be inspected by the Engineer and/or the Local Authority before proceeding any further. Inspection and testing shall occur after each lift during filling. Testing (in accordance with Table 8.1 of AS3798.1) shall be arranged by the contractor such that results are available at time of inspection.
E6. Subgrade shall be compacted to achieve 98% standard density ratio for cohesive soil, and 75% density Index for cohesionless soil. Prior to filling, subgrade is to be proof roll tested. All proof roll testing is to be witnessed by the Engineer. The test shall consist of witnessing soil deflection from the tyre of a single rear axle truck driven at walking speed with a minimum 8 tonne rear axle load and a tyre pressure of 550 kPa. The allowable deflection of subgrade shall not be more than is just visible to an observer standing still as the test vehicle passes, and no visible movement is allowed for sub-base and base tests. Other vehicles that may be allowed by the Engineer are a 12 tonne static roller with 6 tonne/m load, or 20 tonne plant with 450 kPa tyres and greater than 0.035 m² contact area per tyre.
E7. Fill shall be placed in horizontal layers of 200 to 300 mm deep loose measurement, unless testing can demonstrate to the Engineer that compaction is adequate within larger lifts. Compact each layer of fill within 1% of its optimum moisture content. Maximum particle size is two thirds depth of each lift. Each layer is to be proof roll tested, using nuclear density testing as directed to achieve 98% standard density ratio. For material 60 mm and courser, in-lieu of density testing a test by deflection to done using spot level difference at representative locations before and after rolling three times with 12 tonne roller, with acceptable differences being less than 2 mm.
E8. Cohesionless (granular) Fill to be used unless otherwise approved by the Engineer. Cohesionless (granular) fill to have less than 35% passing the 75 micron sieve, with grading curves submitted for approval. Cohesionless fill shall be compacted to the requirements of Table 5.1 of AS3798. Cohesive fill shall have a minimum 4 day soaked CBR of 5% and a maximum CBR swell of 1%. Minimum standard density ratios for cohesive material shall be as per Table 5.1 of AS3798. Reactive clay shall have a maximum standard density ratio of 100%. Landscaping zones should be compacted to standard density ratio of 85% unless noted otherwise.

ROADWORKS

R1. It is assumed roads accessing the development site are adequate to take the design traffic load during the design life of 40 years.
R2. Pavement depth shall be as shown on the typical cross section but shall be subject to CBR testing of subgrade or proof rolling, with final depth shall be confirmed by the Engineer.
R3. Kerb and channel shall be formed on a minimum of 100mm sub-base (see note R7) which shall extend a minimum 150 mm beyond the back of the kerb.
R4. Subsoil drains shall be formed as shown on the drawings and in accordance with AS/NZS3500.
R5. All radii are to the back of kerb.
R6. The road profile and cross-fall shall be finished to the satisfaction of the Engineer and shall be to line and level indicated on the drawings, free of any local high or low areas which may hold water.
R7. All gravel to comply with the following DIER specifications:
base course: FAKI class A - 19 mm Fine Crushed Rock (FCR)
Sub-base course: Sub-base 1 - 40 mm FCR
R8. Sub-base shall have a minimum modified density ratio of 95% and base to have a minimum modified density ratio of 98%, with nuclear density test results available at proof roll inspection. Tests to be taken at a frequency based on AS3798 (typically the greater of four tests per inspection or one test per 1000 m²).
R9. Proof roll shall be with a Truck using a single rear axle, tyres at 550 kPa, and the load over rear axle shall be 8 tonnes.
R9 All landscaped areas affected by the works are to be reinstated to match existing. Refer Landscape Architect for specific requirements.
R10. Concrete footpaths and driveways are to be constructed to the Municipal Standard drawings unless noted otherwise.

STORMWATER

SW1. All materials and workmanship shall be in accordance with the local authority's specifications, standard drawings, by-laws and AS/NZS3500.
SW2. Pipe and channel infrastructure has been designed to convey 20-year average recurrence interval (ARI) storms, with overland flow paths provided for 100 year ARI storms. It is assumed that water flowing onto the development site is contained within Local Authority infrastructure for 20 year ARI storms and the road reserve for 100 year ARI storms. For storms up to 24 hours duration, an allowance of 25% extra rainfall intensity has been made due to protected future climate change in Tasmania (above the 90-years-to-1983 Intensities compared to projected ones in approximately 2080).
SW3. Stormwater trenches, pipe bedding and back filling to comply with the Concrete Pipe Association of Australia Installation requirements for type HS2 support.
SW4. Below ground pipework and fittings to be PVC-U SWHD, joints shall be of solvent cement type or flexible joints made with approved rubber rings.
SW5. Minimum grade of paved areas and pipework shall be 1 in 100. Paved areas ideally shaped to drain to grated pits and trenches without ponding (acceptable limit is 3 mm under a 2 m straight edge).
SW6. Surface water drains, catchpits/grated pits, and junction boxes shall be constructed as detailed or as specified by the manufacturer. Grated pits to have 150 mm sumps. Pits and lids to be Class A in non-trafficked areas, and pre-cast concrete Class C elsewhere. Convey trench water into pits/manholes through weep holes on upstream side using 2 m of DN100 ag-drain with filter sock.
SW7. Install all agricultural drains to the requirements of AS/NZS3500 and part 3.1.2. of the BCA.
SW8. All hydraulic connections and tapings to be clear of driveways and trafficked areas.
SW9. Where both stormwater and sewer lines are along rear and side boundaries they shall be located to fit inside a 3.0 m easement unless noted otherwise. A single line shall fit within a 2.0 m easement.
SW10. All manholes to be located clear of future fencelines.
SW11. Property connections to be clear of driveways and clear of future fencelines.

SEWER

S1. All works in accordance with the Sewerage Code of Australia W.S.A.A 02-2002-2.3 M.R.W.A. Edition - Version 1 and Southern Water's Supplement (Public 05 issued May 2013).
S2. Property connections to be DN100 PVC-U with a minimum grade of 1 in 60. (Refer above code WSAA SEW-1106). To be located clear of trafficked areas, driveways and fences.
S3. Where both stormwater and sewer lines are along a rear or side boundary they shall be located in an easement that wholly contains both services. Refer Southern Waters Supplement Clause 4.2.5. and Clause 4.4.5.2 for clearances to other services.
S4. All manholes to be located clear of future fence lines with end of lines to be 1.2 m past the boundary for any future extension. Refer Clause 4.3.6.

WATER

W1. All works in accordance with the Water Supply Code of Australia W.S.A. 03-2011-3.1 M.R.W.A. Edition - Version 2 and Southern Water's Supplement (Public 03 issued May 2013)
W2. Single house connections to be DN25 HDPE class 16 to Southern Water's standard drawing TW-SD-W-20 series with meter, backflow device and bee to each lot. Located 500 mm inside boundary and 500 mm from edge of driveway on middle side of lot.
W3. All water mains to be tested and witnessed by the relevant water corporation inspector to static pressure plus 50% prior to backfilling.
W4. All hydraulic connections and taping to be clear of driveways and trafficked areas.
W5. For minimum cover over pipes refer to Clause 7.4.2 of the above Supplement.
W6. All trenches under trafficked areas to be back filled with approved compacted FCR including future driveway extensions.
W7. Flushing of mains to be carried out in accordance with the manufacturer's recommendations.
W8. Electromagnetic tracker tape to be placed in all water main trenches above the pipe.
W9. Taping and takeoffs to be separated by at least 1000 mm.
W10. Water mains to be bedded on 80 mm approved 7 mm clean metal.
W11. Concrete anchor blocks to be provided at all sudden changes of direction, both vertically and horizontally at tees and end of lines. Refer to above code drawings MRWA-W-205B and MRWA-W-205C.
W12. Road crossings:
DN100 PVC-U conduits for all HDPE.
DICL with PE wrapping sleeve as per City West Water approved products catalogue.
W13. For valve and hydrant surface box markings refer to Clause 8.10.3 of the above Supplement. Hydrant road markings to comply with the Institute of Municipal Engineering Australia Tasmania Division document titled Fire Hydrant Guidelines - refer section 8. All valves and hydrants to be resilient seated powder coated class 16 and all components to be DN500.

MASONRY

M1. All workmanship and material shall be in accordance with AS 3700-2001.
M2. Blockwork strength – Grade 12.
M3. Mortar mix shall be Class M3 - 1 : 1 : 6 Cement : Lime : Sand.
M4. Cavities and cores to be grout filled shall be kept clear of mortar droppings, or blockouts provided to allow cleaning out at base.
M5. Grout used to fill reinforced masonry shall be N20 grade with sufficient slump to adequately fill the blockwork units.
M6. Cover to reinforcement to be 15mm to inside of masonry units (20mm for exposure classification B1).
M7. Refer to the Architectural drawings for details of control joints in masonry walls. If none are shown, provide joints at 8.0m centres. Control joints shall be 10mm wide, free of mortar, and sealed with an appropriate flexible sealant.
M8. Unless otherwise specified, provide galvanised brick ties at 600mm vertical centres across all control joints and tie masonry walls to steel, concrete or reinforced masonry beams and columns at 600mm centres horizontally and vertically respectively.
M9. Masonry anchors in hollow masonry to be chemical anchors with sieve insert.

RETAINING WALLS

RW1. Retaining walls shall be constructed in accordance with AS4678-2002.
RW2. Backfill to walls shall be an approved granular material (clay shall not be used). A 300mm wide free draining drainage layer shall be provided behind the wall.
RW3. Provide a suitable waterproofing system to the rear of the wall, unless confirmed otherwise.
RW4. The wall shall be drained with 100mm slotted PVC pipe installed at 1% fall (minimum) and be connected to the stormwater disposal system (or weepholes installed at the base where appropriate).
RW5. The Contractor shall maintain excavated batters at a stable slope and provide shoring to steeper excavations until construction and backfilling of the wall is complete.
RW6. Retaining walls that rely on other structural elements for stability shall be provided with temporary support until after these elements have been constructed.
RW7. The Contractor shall allow a suitable curing period prior to backfilling. Backfilling shall be performed in a controlled manner which will not impose excessive stress on the wall.

LEGEND

- 560 EX — Existing surface level (surveyed)
- 560 EX — Existing surface level (interpolated)
- 980 — Proposed bulk earthworks level
- 980 — Proposed finished surface level
- W — Existing water supply external to building
- W — Proposed water supply external to building
- DRAIN — Existing fire supply
- FS — Proposed fire supply
- Existing sewer drain
- S — Proposed sewer drain
- SW — Proposed sewer drain (greasy waste)
- TW — Proposed sewer drain (trade waste)
- Existing stormwater drain
- SW — Proposed stormwater drain
- Proposed stormwater (larger)
- AG — Proposed DN100 ag. drain and geofabric sock
- CW — Proposed cold water supply internal to building
- HW — Proposed hot water supply
- HWF — Proposed hot water supply (flow)
- HWR — Proposed hot water supply (return)
- TMW — Proposed tempered water supply
- CJ — Proposed concrete construction joint
- KJ — Proposed concrete key joint
- SJ — Proposed concrete sawn joint
- SS — Proposed sediment fence

REV	DESCRIPTION	APP'D	DATE
D	REVISED FOR PLANNING APPROVAL	AC	06.07.18
C	REVISED FOR PLANNING APPROVAL	AR	13.03.18
B	REVISED FOR PLANNING APPROVAL	AR	16.08.17
A	PLANNING APPROVAL	AR	08.09.16

GANDY AND ROBERTS CONSULTING ENGINEERS
159 DAVEY ST, HOBART
TASMANIA, AUSTRALIA 7000
www.gandyandroberts.com.au
mail@gandyandroberts.com.au
ph 03 6223 8877 fx 03 6223 7183

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING TITLE:
DRAWING INDEX AND NOTES

0 50mm SCALE - @ A1

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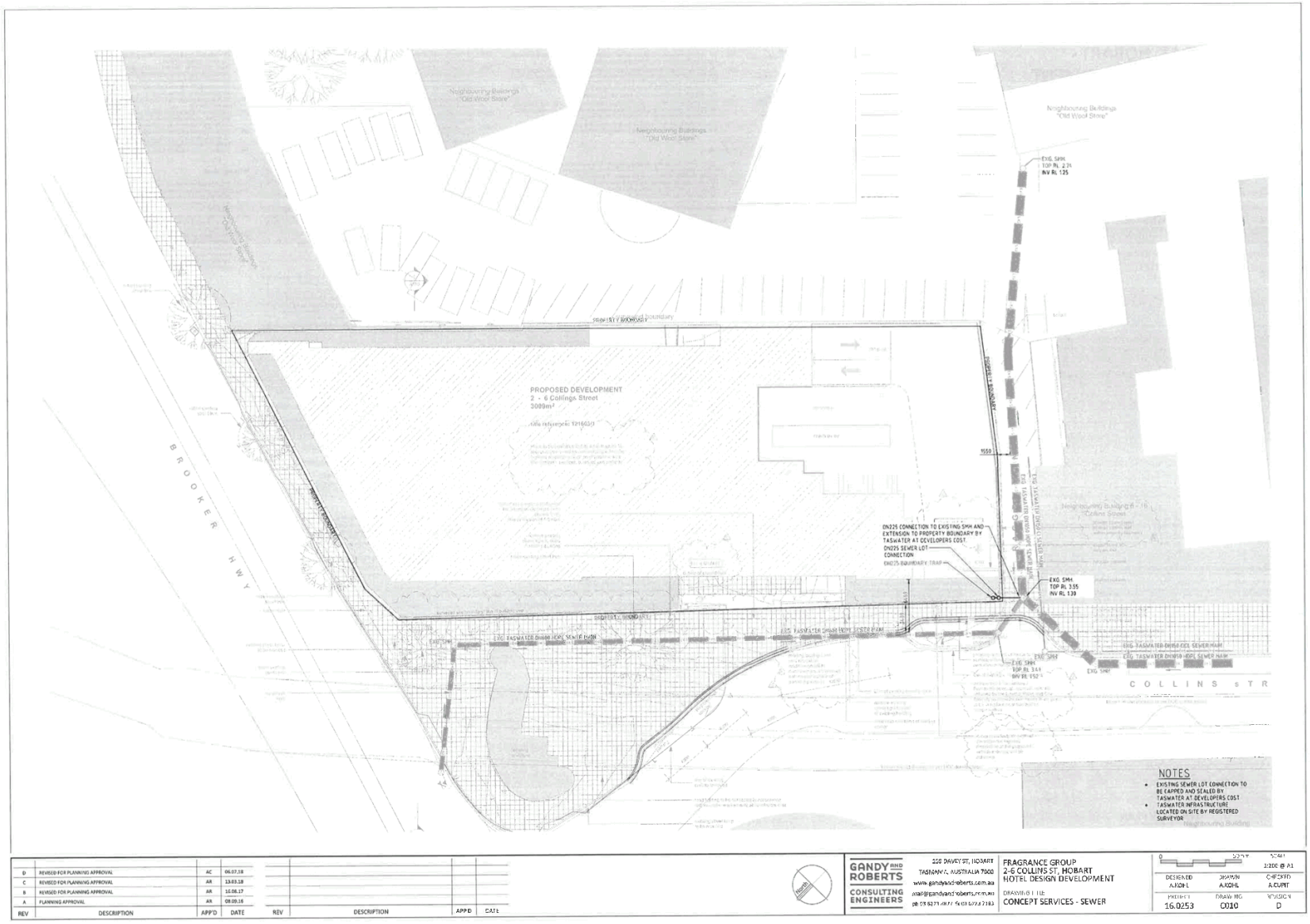
A.KOHL	A.KOHL	A.CURT

PROJECT	DRAWING	REVISION
16.0253	C001	D



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D	REVISED FOR PLANNING APPROVAL	AC	06.07.18				
C	REVISED FOR PLANNING APPROVAL	AR	13.03.18				
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GANDY AND ROBERTS CONSULTING ENGINEERS
155 DAVEY ST, HOBART
TASMANIA, AUSTRALIA 7000
www.gandyandroberts.com.au
mail@gandyandroberts.com.au
ph 03 6271 4871 fx 03 6223 2183

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING TITLE:
CONCEPT SERVICES - SEWER

DESIGNED	DRAWN	CHECKED
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PROJECT	DRAW ING	REVISION
16.0253	C010	D

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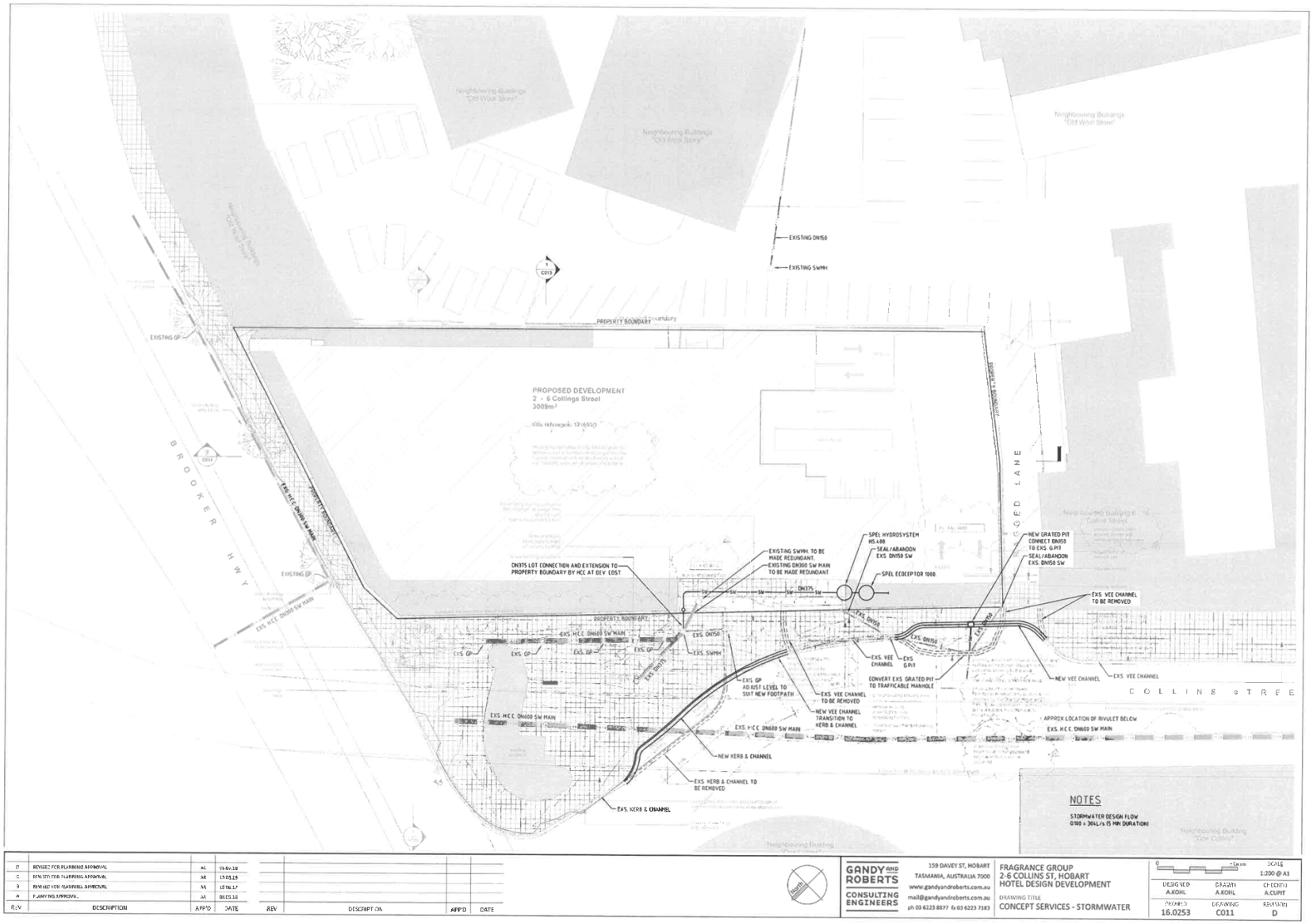

REV	DESCRIPTION	APP'D	DATE
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C	REVISED FOR PLANNING APPROVAL	AR	19.06.18
B	REVISED FOR PLANNING APPROVAL	AR	18.06.17
A	PLANNING APPROVAL	AR	08.05.18

REV	DESCRIPTION	APP'D	DATE

GANDY AND ROBERTS CONSULTING ENGINEERS

159 DAVEY ST, HOBART
TASMANIA, AUSTRALIA 7000
www.gandyandroberts.com.au
mail@gandyandroberts.com.au
ph 03 6223 8877 fx 03 6223 7183

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING TITLE
CONCEPT SERVICES - STORMWATER

SCALE 1:200 @ A1

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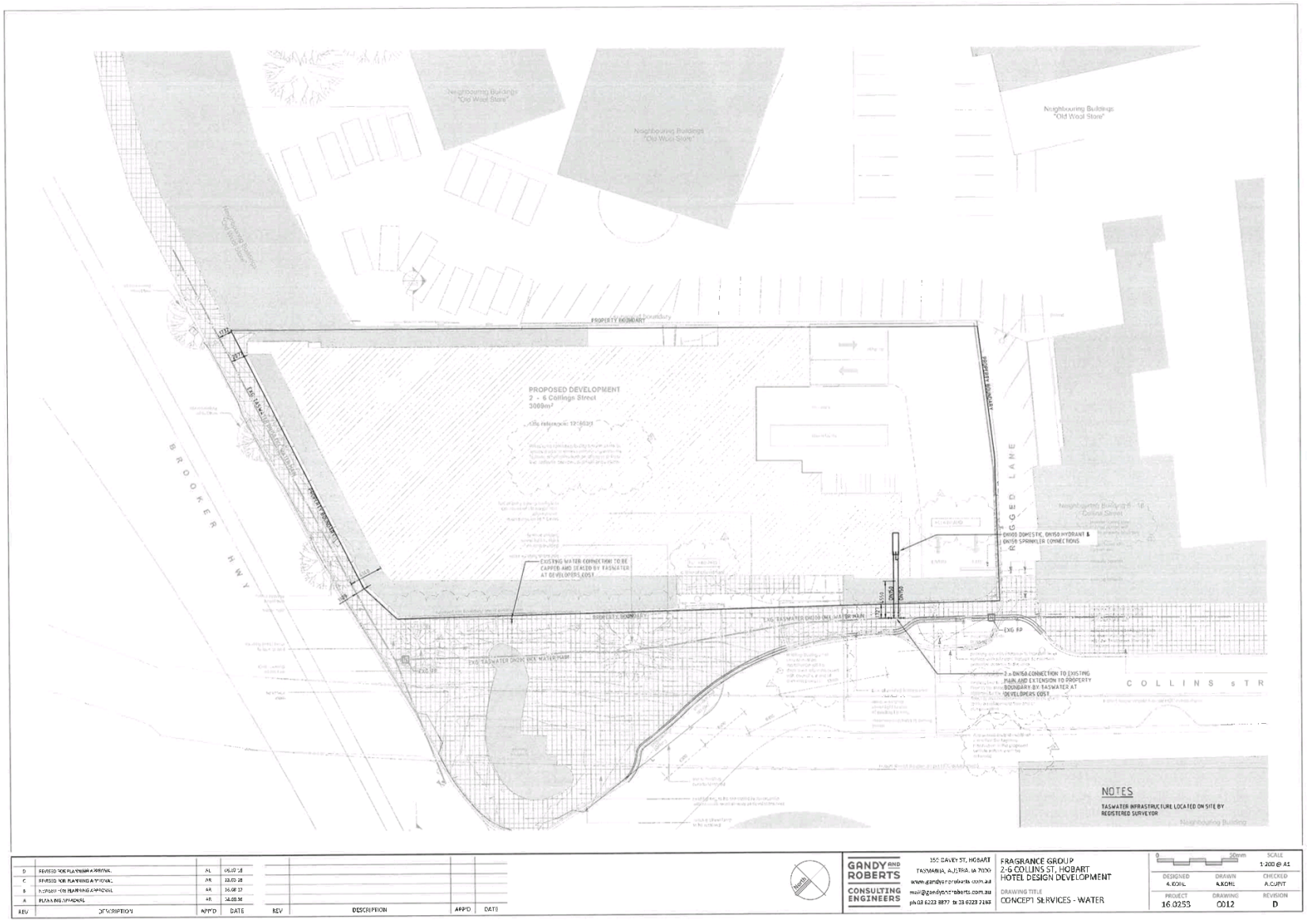
A.KOHL	A.KOHL	A.CLIFFT
PROJECT	DRAWING	REVISION
16.0253	C011	D



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D	REVISED FOR PLANNING APPROVAL	AL	05.07.18				
C	REVISED FOR PLANNING APPROVAL	AR	22.05.18				
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A	PLANNING APPROVAL	AR	14.03.18				

GANDY AND ROBERTS CONSULTING ENGINEERS

155 DAVEY ST, HOBART
TASMANIA, AUSTRALIA 7000
www.gandyandroberts.com.au
mail@gandyandroberts.com.au
ph 03 6223 8877 fx 03 6223 2183

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING TITLE
CONCEPT SERVICES - WATER

SCALE	
1:200 @ A1	
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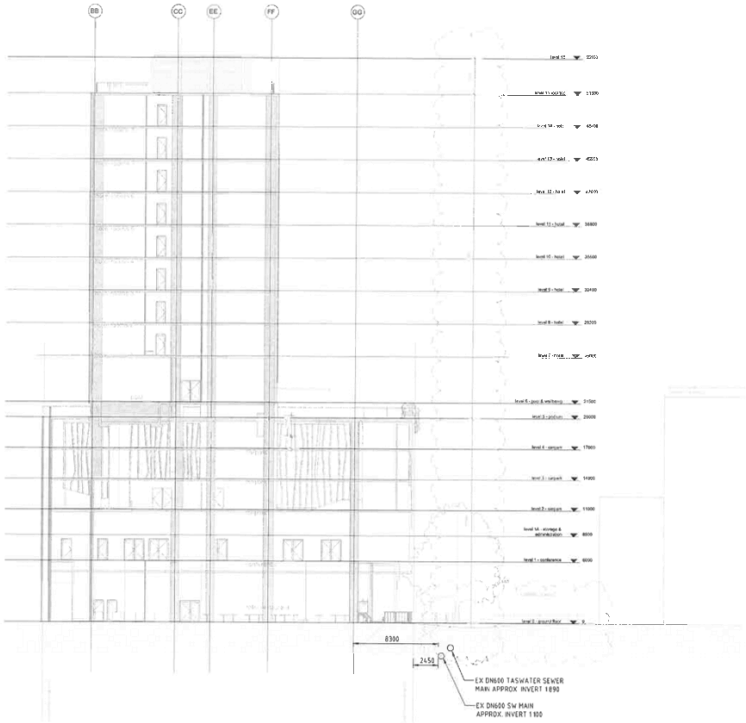
A.KOHL	A.KOHL	A.CURVT
PROJECT	DRAWING	REVISION
16.0253	C012	D



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C	REVISED FOR PLANNING APPROVAL	AC	05.05.18
B	REVISED FOR PLANNING APPROVAL	AK	14.03.18
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GANDY AND ROBERTS
CONSULTING ENGINEERS

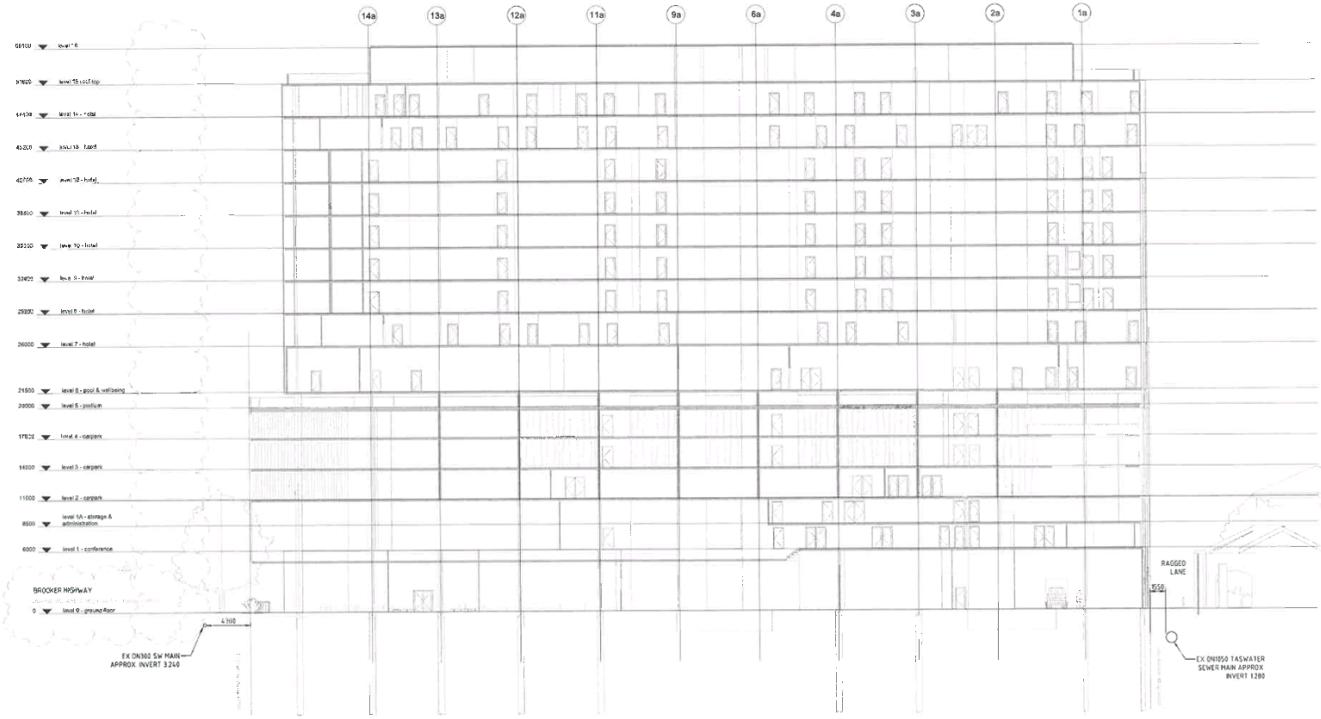
159 DAVEY ST, HOBART
TASMANIA, AUSTRALIA 7000
www.gandyandroberts.com.au
mail@gandyandroberts.com.au
ph 03 6225 0177 fx 03 6223 7183

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING TITLE
SECTION 1

0 50mm

SCALE	
1:200 @ A1	
DESIGNED	A.KOHL
DRAWN	A.KOHL
CHECKED	A.COHT
PROJECT	16.0253
DRAWING	C013
REVISION	C



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C	REVISED FOR PLANNING APPROVAL	AC	08.07.18				
B	REVISED FOR PLANNING APPROVAL	AR	12.03.18				
A	PLANNING APPROVAL	AR	16.08.17				

GANDY AND ROBERTS CONSULTING ENGINEERS

199 DAVEY ST, HOBART
TASMANIA, AUSTRALIA 7000
www.gandyandroberts.com.au
mail@gandyandroberts.com.au
ph 03 6223 8877 fx 03 6223 7185

FRAGRANCE GROUP
2-6 COLLINS ST, HOBART
HOTEL DESIGN DEVELOPMENT

DRAWING TITLE
SECTION 2

0 50mm

SCALE	
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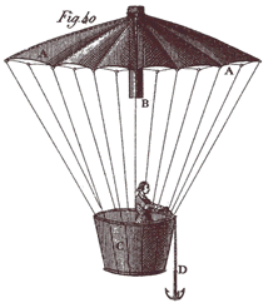
DESIGNED	DRAWN	CHECKED
A.KO-IL	A.KOHL	A.CUPIT
PROJECT	DRAWING	REVISION
16.0253	C014	C

5 Appendix – Calculations

Level	Basins	Bath	Urinal	Water Closet	Sink	Shower	ET's	Area Type
Ground Floor	13	0	5	9	6	0	4	Restaurant/Bar/Hotel Kitchen
1st Floor	23	0	6	27	3	0	14	Conference Rooms
2nd Floor	0	0	0	0	0	0	0	Car Park
3rd Floor	0	0	0	0	0	0	0	Car Park
4th Floor	0	0	0	0	0	0	0	Carpark
5th Floor	0	0	0	0	0	0	0	Outdoor Terrace / Podium
6th Floor	21	3	2	23	0	16	10.4	Pool/Gym/Health Retreat/Lounge
7th Floor	34	18	0	34	0	34	14.4	Hotel Rooms
8th Floor	34	18	0	34	0	34	14.4	Hotel Rooms
9th floor	34	18	0	34	0	34	14.4	Hotel Rooms
10th floor	34	18	0	34	0	34	14.4	Hotel Rooms
11th Floor	34	18	0	34	0	34	14.4	Hotel Rooms
12th Floor	34	18	0	34	0	34	14.4	Hotel Rooms
13th Floor	34	18	0	34	0	34	14.4	Hotel Rooms
14th Floor	34	18	0	34	0	34	14.4	Hotel Rooms
Totals	329	147	13	331	9	288	143.6	
Fixture Units	329	588	13	1324	27	576		
Total Fixture Units	2857							

Average Dry Weather Flow	78'693L per Day or 0.91 L/s
Peak Dry Weather Flow	25'395 per Day or 2.95 L/s
Probable Simultaneous Domestic Water Flow	9.0 L/s as per AS3500.1

Domestic Flow	9.0 L/s @ 800 kPa
Fire Hydrant Flow	20 L/s @ 350 kPa
Fire Sprinkler Flow	15 L/s @ 350 kPa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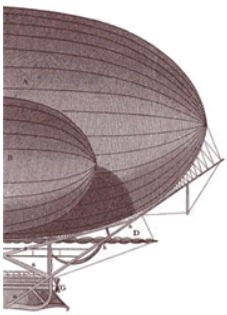

GANDY AND ROBERTS
159 DAVEY ST
HOBART TASMANIA
AUSTRALIA 7000
CONSULTING ENGINEERS

2-6 Collins St, Hobart

Hydraulic Servicing Report

for Fragrance Group Pty Ltd

16 August 2017

Version control

Revision	Description	Issue date	Issued by
A	Final Draft	16/8/2017	Adam Kohl

PROJECT NUMBER **16.0253**
REPORT AUTHOR **Adam Kohl**
CHECKED BY **Simon Palmer**

Gandy and Roberts Consulting Engineers
STRUCTURAL CIVIL HYDRAULICS

ph (03) 6223 8877
fx (03) 6223 7183
mail@gandyandroberts.com.au
159 Davey Street Hobart, Tasmania 7000
www.gandyandroberts.com.au

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6 Water Minimisation Strategy 5
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Appendix 2 – SPEL Stormwater Management Proposal 7

1 Context

Gandy and Roberts Consulting Engineers have been engaged to provide a civil and hydraulic concept services design for the proposed hotel at 2-6 Collins St, Hobart. As part of the planning approval, there is a Hobart City Council RAI (SW2 & SW4) that requires a hydraulic servicing report to compliment the concept services design.

The required report relates to the "proposed treatment train, including estimations of contaminant removal, water minimising strategies and how stormwater flows from the site relate to the receiving capacity of the existing stormwater main.

2 Site details

The proposed development will completely cover the site, and will provide undercover car parking for 167 cars. Total catchment area of 6841m2 with 100% being impervious. Maximum flow rate of 304L/s. The only source of stormwater pollution of note is due to materials brought in from off the site such as gross pollutants, wind-blown dust and hydrocarbons from vehicles. With the development being an enclosed building covering the site, the water quality risks are very low.

3 Stormwater Treatment System

The proposed treatment system is a SPEL Ecoceptor (Primary Treatment) complete with a SPEL Hydrosystem (Tertiary Treatment) which focuses on sediment removal, but also treats nutrients and hydrocarbons. The stormwater quality modelling was undertaken using the MUSIC version 6.2 software to achieve a 91.4% reduction in total suspended solids and almost 54.9% reduction in total phosphorus, 50.5% reduction in total nitrogen. The Ecoceptor & Hydrosystem is located external to the building and is the only stormwater treatment devices proposed for the development.

4 Maintenance Plan

The Ecoceptor & Hydrosystem will require regular cleaning as per the manufacturer's guidelines published on their website. This will be undertaken by the building operators, typically contracted out to a company such as Veolia using a vacuum truck. The Ecoceptor will require a separate pump out of the silt and the hydrocarbons. The design report assumes a frequency of maintenance of 6 months for the first 2 years, with future maintenance subject to regular inspections.

The Hydrosystem has an allowance for one filter change throughout a 10 year period (If required).

5 Site Stormwater Flows

The existing site is 100% impervious, so there is no increase to the existing catchment. Any additional water captured by the proposed hotel façade, is already included within the existing catchment.

An estimated capacity of the existing DN375 stormwater main has been quantified as 360 L/s with 30L/s being taken up from the upstream pits along the footpath. (Refer to Appendix 1)

The maximum flow rate from the site is 304 L/s leaving 26 L/s capacity in the stormwater main. It is also noteworthy that there is a relatively short run to the discharge in the rivulet. Stormwater detention is not proposed for this development.

6 Water Minimisation Strategy

There are a number of water minimisation options available that will be considered for the final development with a few listed below.

- Water saving tapware
- Timed tapware in public areas
- Recycling of fire services test water

Appendix 1 – Stormwater Main Capacity

From: Clifford, Robert [mailto:cliffordr@hobartcity.com.au]
Sent: Friday, 11 August 2017 1:42 PM
To: Jarryd Field <Jarryd@gandyandroberts.com.au>
Cc: Enviro Referrals <enviroreferrals@hobartcity.com.au>
Subject: RE: 2 Collins St. Development - Capacity of stormwater system

Hi Jarryd,

As an estimate, the capacity of our DN375 would be 360 l/s. We already have approx. 30 l/s taken up from the upstream pits along the footpath which feed into this (1% event).

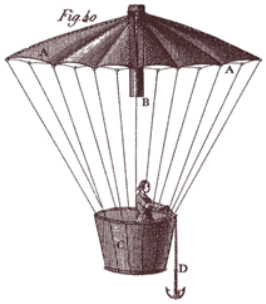
Best regards,

Robert Clifford *BE(Hons)*
Stormwater & Waterways Engineer | City Infrastructure

City of HOBART

16 Elizabeth Street, Hobart 7001, Tasmania | hobartcity.com.au
Telephone (03) 6238 2790 | 0417 879 333

Appendix 2 – SPEL Stormwater Management Proposal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SPEL Stormwater Management Proposal

Gandy & Roberts

Proposed Stormwater Plan for Collins Street Hotel, Hobart, Victoria

Document No: 55538_SWMP_R1

Report Date: August 16, 2017

INTEGRATED WATER SOLUTIONS
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SPEL

AKS ENVIRONMENTAL SOLUTIONS

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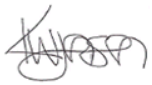
SPEL ENVIRONMENTAL

AKS ENVIRONMENTAL SOLUTIONS

Document Control Record

Designer:	James Barker
Position:	Civil Engineer
Signed:	
Date:	16 August 2017

Approved By:	Kurt Jensen
Position:	Environmental Division Manager
Signed:	
Date:	16 August 2017

SPEL ENVIRONMENTAL

Revision Status

Revision No	Description Of Revision	Date:	Approved:
1	SUBMISSION	16 August 2017	

AKS Environmental
ABN 88 151 483 984
191 Station Street
Corio VIC 3214

Telephone: + 61 3 5274 1336
Fax: +61 3 5274 9966
Email: kurt@aksindustries.com.au

Confidentiality

Section 1

1 Confidentiality

1.1 Conferee

This entire document has been presented to Gandy & Roberts as **commercial-in-confidence** on the basis that it should not be disclosed in any part or whole to any third party without written consent from AKS Environmental.

This document contains:

- **Intellectual Property** – Material and design that are commercially sensitive intellectual property
- **Pricing Schedule** - Information from AKS Environmental and details about commercially sensitive pricing

1.2 Request for Information

Please direct all enquiries regarding this submission to:

Kurt Jensen | Environmental Division Manager
AKS Environmental
191 Station Street
Corio Victoria 3214

Telephone: + 61 3 5274 1336
Fax: +61 3 5274 9966
Email: kurt@aksindustries.com.au

Executive Summary

Section 2

2 Executive Summary

SPEL Environmental has been commissioned by Gandy & Roberts to prepare a Conceptual Stormwater Management Plan (CSMP) for the proposed precinct development located at Collins Street, Hobart.

The stormwater quality modelling was undertaken using the MUSIC version 6.2 software. The modelling results (see **Table 2.1**) indicate the 70%, 80%, 45% and 45% reduction targets for Gross Pollutants (GP), Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN) respectively can be achieved.

Table 2.1: Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Reduction Target (%)
Total Suspended Solids	129	11.1	**91.4**	80.0
Total Phosphorus	0.329	0.148	**54.9**	45.0
Total Nitrogen	2.99	1.48	**50.5**	45.0
Gross Pollutant	2.99	3.85E-6	**100**	70.0
Flow (ML/yr)	1.16	1.16	**0**	0

Stormwater management for the site is achieved using the following devices:

- One (1) x SPEL Ecoceptor 1000
- One (1) x SPEL Hydrosystem HS.400

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Overview

Section 3

SPEL ENVIRONMENTAL

3 Overview

3.1 Company Background

SPEL Environmental is a market leader in the environmental compliance sector since 1991. During that time, we have established many satisfied customers who return to SPEL Environmental when they require new and more advanced technological solutions and services. SPEL Environmental devotes a great deal of time, effort and financial investment to maintain our position as a market leader in a rapidly developing field. We employ the latest industry knowledge and advancements, providing our customers with the most progressive stormwater improvement technology.

SPEL Environmental develops long term partnerships with our clients and providing on-going technical support which include a comprehensive scheduled service and maintenance program. We take pride in delivering quality workmanship and customer satisfaction that has created a market reputation, taking SPEL Environmental to where it is today. In order maintain this vision and standard, we are heavily committed to Australian manufacturing and site water quality testing programs to control and maintain consistent quality.

SPEL Environmental is committed to the health and safety of its people and protecting the environment in which they work. We understand the challenges associated with a project of this nature and the physical environment involved. Our safety, environmental and quality standards apply to all our people, products and services, providing certainty that the client's safety, environmental and quality requirements are adhered to.

3.2 Introduction

This report has been prepared by SPEL Environmental to accompany and be considered part of a Development Application (DA) for a proposed precinct development located at Collins St, Hobart The site is located within the catchment of the City of Hobart Council.

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3.3 Site Locality

The subject site is bounded by Brooker Hwy to the North, Collins St to the West and Ragged Ln to the South. Situated in the City of Hobart Council the site has a total area of 0.3ha (see **Figure 3.1**).

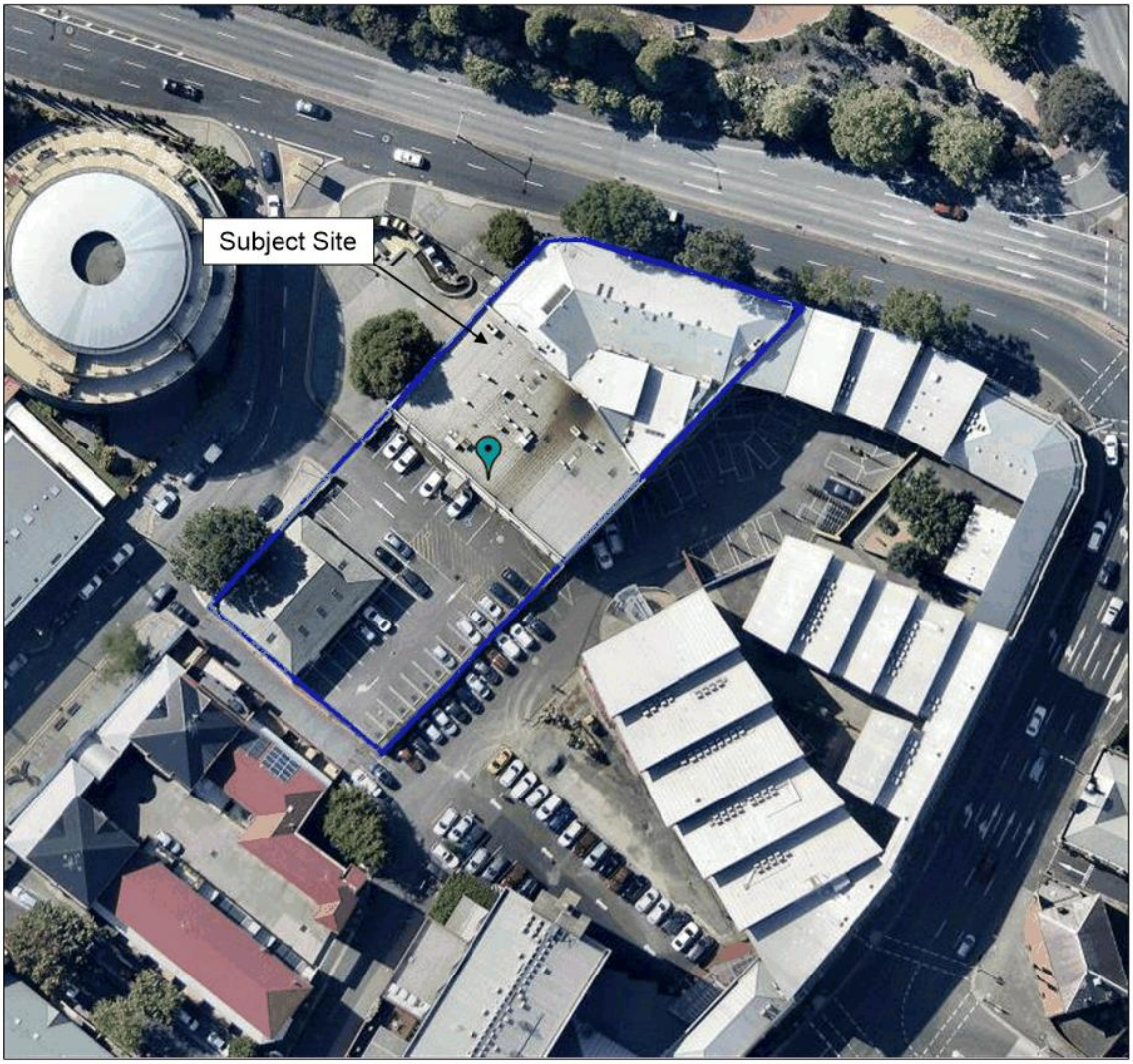

Figure 3.1 Site Location

SPEL ENVIRONMENTAL

3.4 Site Layout

The proposed development is presented on **Figure 3.2**.

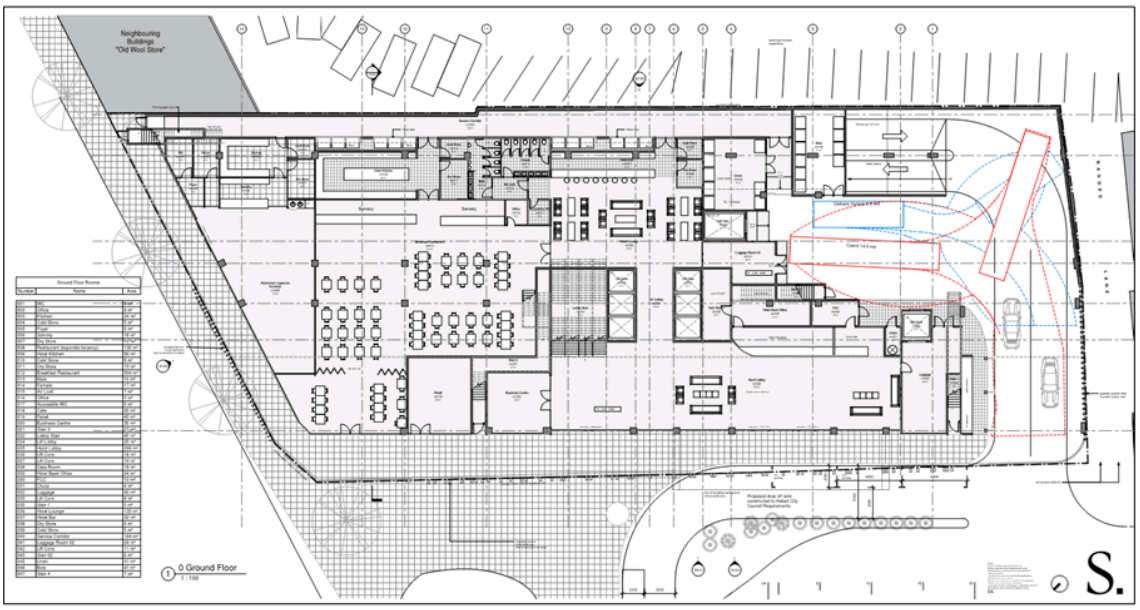

Figure 3.2 Proposed Site Layout

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Quality Management – Operational Controls

Section 4

SPEL ENVIRONMENTAL

4 Quality Management – Operational Controls

4.1 Water Quality Objectives

Melbourne Water (2016) requires treatment of stormwater so that annual pollutant loads achieve targets set out in the Best Practice Environmental Management Guidelines (BPEMG). These are:

- 80% reduction in Total Suspended Solids (TSS) from typical urban loads;
- 45% reduction in Total Nitrogen (TN) from typical urban loads;
- 45% reduction in Total Phosphorus (TP) from typical urban loads; and
- 70% reduction in Gross Pollutants (GP) from typical urban loads.

4.2 Treatment Train

Based on the site characteristics and the range of available Stormwater Quality Improvement Devices (SQIDs), this study has developed an overall concept that will satisfy the requirements of downstream environmental protection. **Figure 4.1** shows a schematic representation of the proposed treatment train elements.

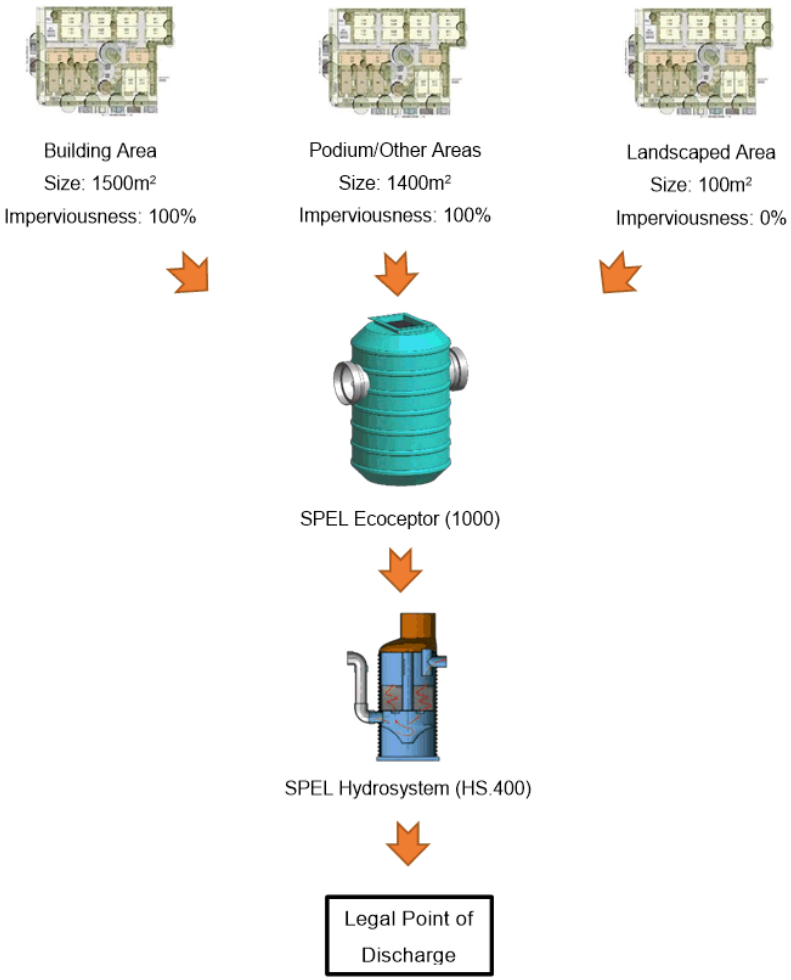

Figure 4.1 Treatment Train Schematic

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4.2.1 SPEL Ecoceptor – General Information

The SPEL Ecoceptor™ is vertically configured, single chamber fibreglass Stormwater Quality Improvement Device (SQID) designed for use in stormwater drains (see **Appendix 1**). The Ecoceptor separates and captures gross pollutants, sediments and silt including light liquids (petroleum hydrocarbons). These, in turn, rise to the top of the chamber (below invert) and are secured in the separation zone till the system is maintained.

- **Vortex separation -** The SPEL Ecoceptor™ has a hydraulic force on incoming flows which produce a vortex cleaning action preventing captured pollutants, including fine TSS, from resuspending and discharging.
- **Ease of maintenance –** The cylindrical shape of the SQID with its tapered base (there are no square corners) affords efficient, effective and thorough cleaning of accumulated pollutants; ***this process if always done without the need of jetting and hosing the accrued mass of pollutants in the base of the system, a process which is common to all concrete systems.***

SPEL engages ongoing site tests for water quality of the Ecoceptor devices continually across a wide spectrum of catchments on Australia`s east coast. We have pleasure in submitting the following independently analysed NATA test results:

- **TSS -** Lab, site testing in conjunction with flow modelling reveals reductions of >80% of TSS.

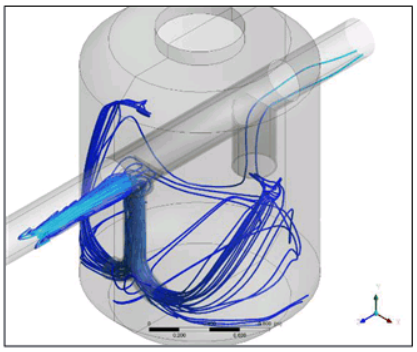


Figure 4.2: Flow in the SPEL Ecoceptor

SPEL ENVIRONMENTAL

AKS ENVIRONMENTAL SOLUTIONS

4.2.2 SPEL Hydrosystem – General Information

The SPEL Hydrosystem is a tertiary stromwater treatment filtration device targeting known pollutants of concern including Total Suspended Solids (TSS); Nutrients (TP & TN); Gross Pollutants; as well as Heavy Metals (i.e. Cu, Zn, Pb). This specialist stormwater filtration system is installed within conventional concrete manholes, polyethylene and fibreglass shafts. The pre-fabricated and pre-assembled SPEL Hydrosystem is quickly and safely installed using onsite diggers (see Figure 4.3 below). This system is designed for an array of applications with treatment flow rates ranging from 2.5l/s up to 144l/s. The Hydrosystem is designed in an off-line configuration and operates at full treatment flow with a hydraulic fall of 250mm across the system.

Figure 4.3: SPEL Hydrosystem (SHS.1000) installation using onsite digger

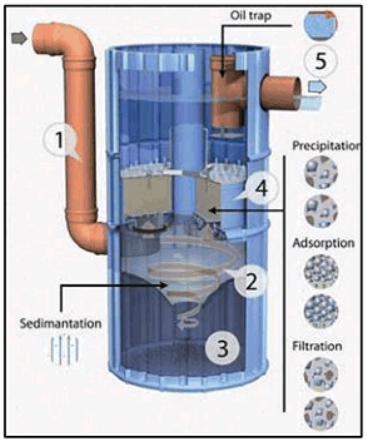
4.2.2.1 International Validation and Testing

SPEL Hydrosystem have been lab and field tested by several Universities and Institutes across Germany. The German Institute for Structural Engineering (DIBt) granted a general technical approval (Z-84.2-4)1 passing all test conditions under heavy trafficable conditions. Field test data has been obtained across Germany including Bremer Straße in Hamburg-Harburg2 reinforcing the above approval.

SPEL ENVIRONMENTAL

Function Principles:

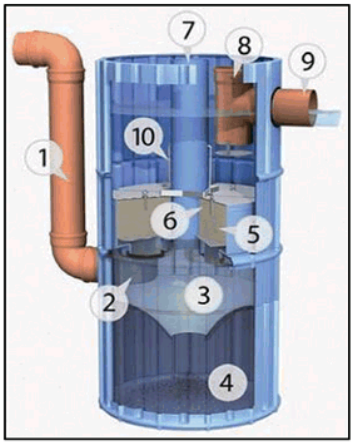
1. The rainwater from the connected area is fed into the basal section of the filter housing. The angled inlet generates a radial flow pattern.
2. The hydrodynamic separator converts turbulent waters into a radial laminar flow pattern, generating particle sedimentation, particularly of the sand fraction.
3. This takes place over an inlet to the lower section of the filter shaft. The sediment is retained in a silt trap chamber below the separator. The silt trap needs to be emptied out at intervals.
4. In the central section of the filter housing is the actual filter,
5. Filter Element: Metal. The filter element filters out the fine materials in an up-flow process and dissolved materials are precipitated and adsorbed. The filter can be backwashed. When exhausted the filter is easily exchanged.
6. The filter element is easily pulled up via shaft openings.
7. Above the filter element is the clean water. It passes via a blockade of light substances and then flows over the outlet into a soak away.



Schematic of SPEL Hydrosystem Process

Product Components:

1. Rainwater Inlet (DN 200).
2. Angled Inlet.
3. Separator Chamber.
4. Silt Trap.
5. Filter Elements (4 No.).
6. Removal Device for Filter Element.
7. Overflow.
8. Blockade of light substances and suction pipe
9. Outlet to storage or to waste.
10. Locking buoyancy control system



Schematic of SPEL Hydrosystem Components

4.3 Maintenance Procedure

The SPEL treatment train specified above is an engineered stormwater treatment solution for the reduction in TSS, nutrients, gross pollutants and hydrocarbons. The Stormwater Quality Improvement Devises (SQIDs) identified in the stormwater treatment solution will required on-going maintenance for a prescribed period as specified by their respective council/authority. A draft of the proposed treatment train maintenance contract can be seen in **Appendix 2**.

AKS ENVIRONMENTAL SOLUTIONS

Quality Analysis - MUSIC

Section 5

SPEL ENVIRONMENTAL

5 Quality Analysis – MUSIC

Water quality modelling has been undertaken of the post-development (mitigated) scenario using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software to demonstrate the load based reduction targets are achieved. A stormwater treatment train has been developed and modelled to determine the effectiveness of the proposed system in achieving the relevant water quality objectives.

5.1 Rainfall and Evapotranspiration Parameters

Table 5.1 summarized the meteorological and rainfall-runoff data used in the MUSIC model.

Table 5.1 Meteorological and Rainfall Runoff Data

Parameter	Value
Rainfall station	04008 Hobart
Time step	6 minute
Modelling period	1993
Mean annual rainfall (mm)	517 mm
Evapotranspiration	895 mm

5.2 Catchment Parameters

Based on the proposed land uses within the development, the subject site has been modelled as an urban source node. The rainfall-runoff parameters and pollutant generation parameters are based on parameters recommended by Melbourne Water (2016) (**Tables 5.2** and **5.3**).

Table 5.2 Rainfall Runoff Parameters

Parameter	All Nodes
Rainfall threshold (mm)	1.0
Soil storage capacity (mm)	120
Initial storage (% capacity)	25
Field capacity (mm)	80
Infiltration capacity coefficient a	200
Infiltration capacity exponent b	1
Initial depth (mm)	10
Daily recharge rate (%)	25
Daily base flow rate (%)	5
Daily deep seepage rate (%)	0

Table 5.3: Pollutant Export Parameters for Urban Sites

Catchment ID		Total Suspended Solids [log (mm/L)]		Total Phosphorous [log (mm/L)]		Total Nitrogen [log (mm/L)]	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Hardst and	Storm Flow Concentration	2.2	0.32	-0.45	0.25	0.42	0.19
	Base Flow Concentration	1.1	0.17	-0.82	0.19	0.32	0.12
Roof	Storm Flow Concentration	2.2	0.32	-0.45	0.25	0.42	0.19
	Base Flow Concentration	1.1	0.17	-0.82	0.19	0.32	0.12

5.3 Treatment Node Parameters

The following sections describe the modelling parameters applied to MUSIC for each of the treatment nodes included as part of the water quality assessment.

5.3.1 SPEL Ecoceptor Parameters

SPEL engages ongoing site tests for water quality of the Stormceptor devices continually across a wide spectrum of catchments on Australia`s east coast. The SPEL Stormceptor parameters utilised within MUSIC are summarised in **Table 5.4**:

Table 5.4 SPEL Ecoceptor Treatment Node Parameters

Catchment ID	SPEL Ecoceptor
Are the proposed pollutant reduction efficiencies independently verified using a method suited to local conditions?	Yes
Does the data provided include performance results under dry weather flows (to account for potential pollutant leeching?)	Yes
It the assumed high-glow bypass rate consistent with manufacturer specifications?	Yes
High Flow by-pass (m^3/s)	0.024
Low Flow	0.000
TSS Input (mg/L) Output (mg/L)	100 31
TN Input (mg/L) Output (mg/L)	100 79
TP Input (mg/L) Output (mg/L)	100 6.7
Gross Pollutants Input (mg/L) Output (mg/L)	15 0

5.3.2 SPEL Hydrosystem Parameters

A generic node has been utilized in MUSIC, for the purpose of simulating treatment efficacy of SPEL Hydrosystem and the transform function in the node has been modified based on SPEL Environmental's 2nd and 3rd Party field testing product data. These test results and papers are available upon request from SPEL Environmental. The SPEL Hydrosystem parameters utilised within MUSIC are summarised in **Table 7.5**.

Table 7.5: SPEL Hydrosystem Parameters

Catchment ID	SPEL Hydrosystem
Are the proposed pollutant reduction efficiencies independently verified using a method suited to local conditions?	Y
Does the data provided include performance results under dry weather flows (to account for potential pollutant leeching?)	Y
It the assumed high-glow bypass rate consistent with manufacturer specifications?	Y
High Flow by-pass (m^3/s) (for each separate system)	0.0025
Low Flow	0.000
TSS Input (mg/L) Output (mg/L)	1000 90
TN Input (mg/L) Output (mg/L)	50 26.5
TP Input (mg/L) Output (mg/L)	5 2.95
Gross Pollutants Input (mg/L) Output (mg/L)	15 0

5.4 MUSIC Results

Results of the MUSIC modelling for the treatment train effectiveness are summarised in **Table 5.6**. The results indicate the 80%, 45%, 45% and 70% reduction target for TSS, TP, TN and gross pollutants respectively are achieved. A screen capture of the MUSIC modelling results is included as **Figure 5.2**.

Table 7.6: Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Reduction Target (%)
Total Suspended Solids	129	11.1	**91.4**	80.0
Total Phosphorus	0.329	0.148	**54.9**	45.0
Total Nitrogen	2.99	1.48	**50.5**	45.0
Gross Pollutant	2.99	3.85E-6	**100**	70.0
Flow (ML/yr)	1.16	1.16	**0**	0

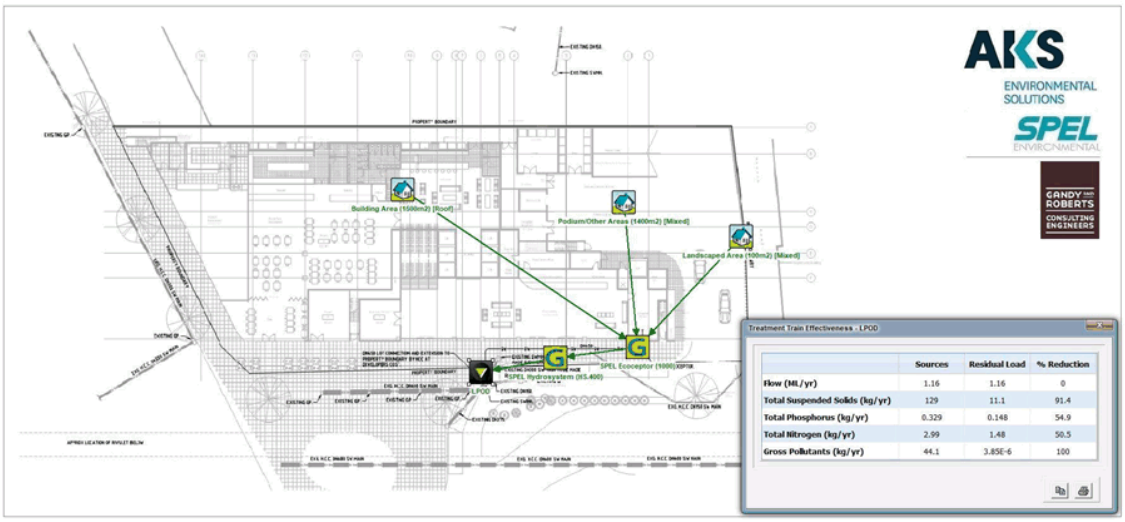


Figure 5.2: Treatment Train Effectiveness & Layout

AKS ENVIRONMENTAL SOLUTIONS

Summary and Recommendation

Section 6

SPEL ENVIRONMENTAL

6 Summary and Recommendation

Based on the water quality assessment using the MUSIC software, it is found that the pollutant reduction targets can be achieved by adopting the SQIDs specified in **Table 6.1**.

Table 6.1: Recommended Stormwater Quality Improvement Devices

Stormwater Quality Improvement Device	Quantity
SPEL Ecoceptor (1000)	1
SPEL Hydrosystem (HS. 400)	1

The recommended SQIDs are designed to capture stormwater at the downstream end of the drainage network and treat the runoff prior to discharging into the local waterway. The pollutant reduction targets achieved (as modelled in MUSIC) are summarised in **Table 6.2**.

Table 6.2: MUSIC modelling results

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Reduction Target (%)
Total Suspended Solids	129	11.1	**91.4**	80.0
Total Phosphorus	0.329	0.148	**54.9**	45.0
Total Nitrogen	2.99	1.48	**50.5**	45.0
Gross Pollutant	2.99	3.85E-6	**100**	70.0
Flow (ML/yr)	1.16	1.16	**0**	0

References

Section 7

7 References

Melbourne Water (2016). *MUSIC Guidelines – Input Parameters and modelling approaches for MUSIC users in Melbourne Water's service area 2016*

List of Appendices

Appendix 1 – SPEL SQID Product Guides
Appendix 2 – Draft Treatment Train Maintenance Contract

AKS ENVIRONMENTAL SOLUTIONS

Appendix 1 – SPEL SQID Product Guides

SPEL ENVIRONMENTAL

SPEL ENVIRONMENTAL
INTEGRATED WATER SOLUTIONS

Introduction

The SPEL Ecoceptor is a hydrodynamic stormwater quality improvement device (SQID) that has a unique treatment action producing low velocity conditions producing discharge water quality outcomes complying to statutory guidelines across Australia. It has been independently tested in Australia and is suitable for all types of conditions and soil-type loadings.

It separates and captures sediments, silt, total suspended solids, nutrients and total petroleum hydrocarbons (TPH) and oil and grease. TPH and oil & grease rise to the "oil-capture" zone of the treatment chamber and are contained in all flow events. Captured pollutants cannot resuspend or scour from the treatment chamber in all flow events.

Areas with a high fraction of impervious surfaces,including car parks, ports, streeetscapes, roads, subdivisions and industrial estates that require stormwater treatment are ideal for the SPEL Ecoceptor. MUSIC node is available on request.

The one-piece, self-contained fibreglass construction , is lightweight and yet robust in strength making it simple and cost-effective when performing installations.

No site assemblage is required as is the case with the heavier concrete devices. The SPEL Ecoceptor fibreglass SQID can be installed in all types of trafficable zones, including vehicular truck (Class D) and aircraft loadings (Class G).

The cyclinderical shape of the SPEL Ecoceptor with its sloped cone-configured base ensures sediment accretes at the centre of the SQID`s base affording easy and simple cleaning.

The fibreglass gel coat ensures that oil and grease are removed without sticking to the sides of the internal walls.

Flow rates on standard units of up to 1400 LPS and can fit pipe sizes from 225mm to 1200mm (other sizes available on request.)

Maintenance

INSPECTION AND CLEANING

The regularity of inspections of the SPEL Ecoceptor is contingent on the features and properties of the catchment area.

SPEL recommends an inspections of the Ecoceptor at the end of the first month after installation to determine the volume of trapped silt and pollutants.

Information sourced can be useful in factoring the frequency of on-going inspections or cleaning operations.

In the event of excessive rain or an oil spill, an inspection is recommended immediately upon such an event.

Ascertain silt depth and if build-up is evident, then a vacuum-loader truck should be engaged for the cleaning of the tank.

SPEL Ecoceptor cleaning procedure is simple, by simply lifting the external lid (two persons may be required), resting it securely in a safe manner and then inserting suction hose into the chamber.

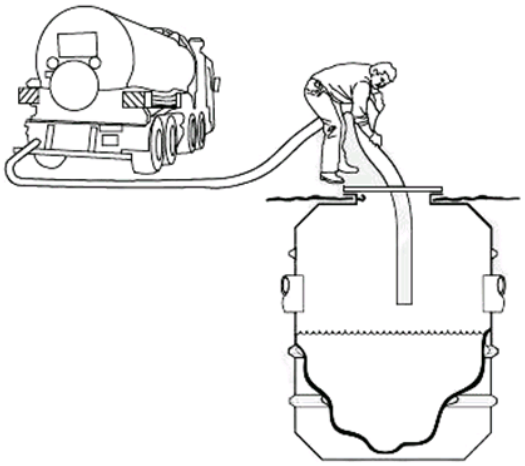
Ensure that the chamber is thoroughly cleaned of all refuse and debris before accessing the chamber - if required.

The chamber is cleaned by inserting the suction hose through the manhole at ground level.

Always commence cleaning from the inlet side of the chamber and ensure on completion of the cleaning operation that the lid is secured to its normal position (and locked if necessary) before departing the site.

IMPORTANT

In the unlikely event of the chamber having to be entered ensure absolutely that all Workplace Health and Safety directives and Confined Space Regulations are strictly adhered to, including wearing long-arm rubber gloves and the appropriate footwear in the event of coming into contact with sharp objects.



VICTORIA & TASMANIA OFFICE

PO Box 292
North Geelong BC VIC 3215

191 Station Street
Corio VIC 3214

Phone: + 61 3 5274 1336
Fax: +61 3 5274 9966

STATE CONTACTS

New South Wales	61 2 8838 1055
Canberra	61 2 6128 1000
Queensland	61 7 3277 5110
Victoria & Tasmania	61 3 5274 1336
South Australia	61 8 8275 8000
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SPEL ENVIRONMENTAL
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SPELFilter Hydrosystem

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SPEL ENVIRONMENTAL
INTEGRATED WATER SOLUTIONS

The Technology

A specialist rainwater filter, designed for installation within load bearing shafts and chambers of concrete or plastic construction. The pre fitted plastic housing is safe and easy to fit at site.

The Hydrosystem 1000 Filter uses an up-flow process. This means there is a minimal head drop between the inlet and the outlet. The cleaned water is of an outstanding water quality. The rainwater is treated within the unit by the following processes: sedimentation, filtration, adsorption and precipitation.

The initial treatment steps take place in the Dynamic Separator, where sedimentation of solid particles occurs within a radial flow regime, characterised by secondary flows.

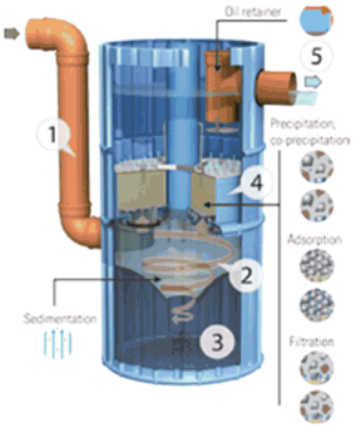
A settling funnel to the silt trap chamber entrance ensures sediments are not remobilised. Above the separator are the filter inserts, covering the entire diameter of the unit's housing, where the second treatment step takes place.

Water flows upwards through the removable filter element. As a result of both the upward flow within the filter element and the fact that the filter remains saturated, the rate of filter clogging by solids is both very limited and slow.

The filter inserts are easy to exchange.

How it works

1. The stormwater from the drained area is fed into the inlet, which is at the lower end of the shaft. A deflector plate sets up a radial flow.
2. Here, sedimentation of particles, especially the sand faction and above, takes place in the hydrodynamic separator. This is due to turbulent secondary flows within a radial laminar flow regime.
3. The settlable solids are collected via an opening in the silt trap chamber. This chamber is evacuated periodically, via the by-pass central tube at intervals.
4. Four filter elements are located within the filter shaft. As waters flow upwards the finer particles are filtered out, whilst the dissolved pollutants are precipitated and absorbed. The filter is easily backwashed, and if completely clogged or exhausted, is easily replaced.
5. Clean water above the filter elements passes to discharge via an oil trap assembly. In the event of major spill, free floating oils etc are retained here. Normal concentrations of dissolved oils are retained within the filter elements.



Technical Data

Stormwater filter complying with DIN 1989-2. Connections: DN 200; the various types of filter elements have different material structures.

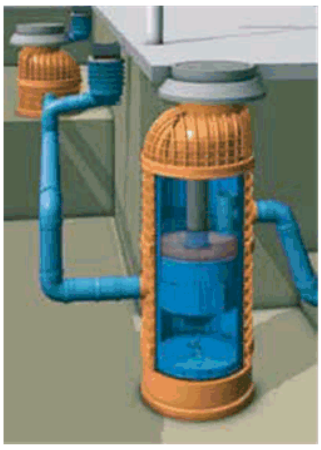
Housing material: Polyethylene
Housing weight: 68 kg
Total weight: 220 to 350 kg depending on filter type
Packing unit SPEL Hydrosystem 1000: Pallet: 1 piece

Accessories 1

SPELFilter element
Weight per filter element:
34 kg (roof / traffic)

Accessories 2

SPELFilter element
Weight per filter element:
54 kg (heavy traffic)
66 kg (metal)



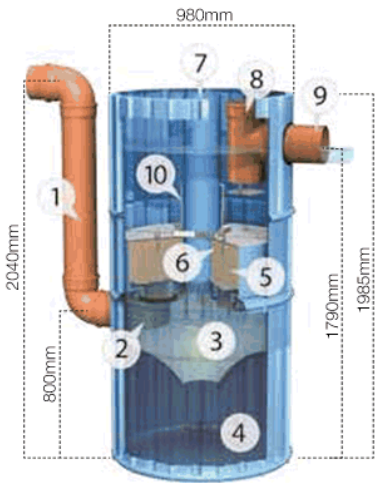
Example: Installation in a shaft made of plastic

Example:

The SPEL Hydrosystem 1000 traffic installed in a concrete shaft DN1000.

Product structure:

1. Stormwater inlet (DN 200)
2. Deflector plate
3. Hydrodynamic separator
4. Silt trap
5. Filter element
6. Extraction aid for filter element
7. Overflow and suction pipe
8. Oil trap
9. Outlet stormwater storage, soakaway system or surface waters
10. Buoyancy restraint for filter elements



The SPEL Hydrosystem is available with various filter types, depending on the usage of the connected area. The Roof type is used for roof areas that do not have a significant proportion of uncoated metals; the Metal type is employed for metal roof areas, and the Traffic type is used for slightly polluted traffic areas.

The Heavy Traffic type is employed for heavily polluted traffic areas and has been granted general technical approval (Z-84.2-4) by the German Institute for Structural Engineering (DIBt). The maximum areas that may be drained depend on the nature of the surfaces. These are given in the following table.

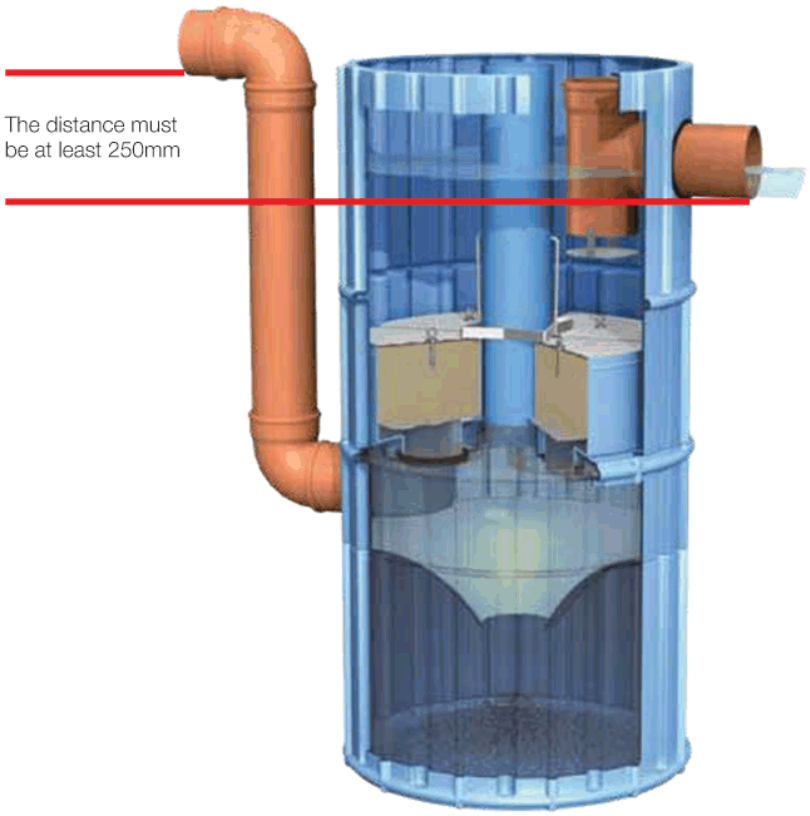
Type	Nature of the surface to be drained	Weight of filter element / piece	Total Weight
Heavy traffic with technical approval (Z-84.2-4)	Highly polluted traffic areas (car parks in front of supermarkets, main roads, HGV access roads)	54kg	300kg
Traffic	Slightly polluted traffic areas (side streets, staff car parks, yards)	34kg	220kg
Roof	Roofs without a significant proportion of uncoated metals (< 50m²)	34kg	220kg
Metal	Roofs made of uncoated metals (copper, zinc, lead)	66kg	350kg

Parameter	Unit	Non Metal Roof		Copper Roof		Zinc Roof		Parking lot, residential street		Main road Distributer		① Aims of LAWA	② Drinking Water	③ Seepage	④ SPEL Hydrosystem
		from	to	from	to	from	to	from	to	from	to	permissible limit	permissible limit	control value	aim
Phsico-chemical parameters												90 Percentile			
electrical conductivity	[uS/cm]	25	270	25	270	25	270	50	2400	110	2400	–	2500	–	< 1500
pH value	[–]	4.7	6.8	4,7	6,8	4,7	6,8	6,4	7,9	6,4	7,9	–	6,5 – 9,5	–	7,0 – 9,5
Nutrients															
phosphorous (P ges)	[mg/l]	0,06	0,50	0,06	0,50	0,06	0,50	0,09	0,30	0,23	0,34	–	–	–	0,20
ammonium (NH_4)	[mg/l]	0,1	6,2	0,1	6,2	0,1	6,2	0,0	0,9	0,5	2,3	–	0,5	–	0,3
nitrate (NO_3)	[mg/l]	0,1	4,7	0,1	4,7	0,1	4,7	0,0	16,0	0,0	16,0	–	50,0	–	–
Heavy Metals															
cadmium (Cd)	[µg/l]	0,2	2,5	0,2	1,0	0,5	2,0	0,2	1,7	0,3	13,0	1,0	5,0	5,0	< 1,0
zinc (Zn)	[µg/l]	24	4.880	24	877	1.731	43.674	15	1.420	120	2.000	500	–	500	< 500
copper (Cu)	[µg/l]	6	3.416	2.200	8.500	11	950	21	140	97	104	20	2000	50	< 50
lead (Pb)	[µg/l]	2	493	2	493	4	302	98	170	11	525	50	10	25	< 25
nickel (Ni)	[µg/l]	2	7	2	7	2	7	4	70	4	70	50	20	50	< 20
chromium (Cr)	[µg/l]	2	6	2	6	2	6	6	50	6	50	50	50	50	< 50
Organic Substances															
polynuclear aromatic hydrocarbons (PAK)	[ug/l]	0.4	0.6	0.4	0.6	0.4	0.6	0,2	17,1	0,2	17,1	–	0,1 6 compounds	0,2	< 0,2
petroleum-derived hydrocarbons (MKW)	[mg/l]	0,1	3,1	0,1	3,1	0,1	3,1	0,1	6,5	0,1	6,5	–	–	0,2	< 0,2

① Aims of the German working group on water issues of the Federal States and the Federal Government (LAWA) for surface water, usage as potable water (1998). ② Permessible of the German Drinking Water Ordinance (2001). ③ Control value for seepage of the German Federal Soil Protection Act an Ordinance (1999) according to § 8 1,2. ④ The aims of the system refer to average annual loads.

Installation

CAUTION! Important information, please observe.



The following is to be checked before installation:

The filter must be installed with a so-called fall. This means that the incoming pipe (stormwater inlet) is led downwards just ahead of the shaft and can be connected to the lower connection as described.

The difference in invert between the incoming pipe and the outlet to discharge must be at least 250mm.

VICTORIA & TASMANIA OFFICE

PO Box 292
North Geelong BC VIC 3215

191 Station Street
Corio VIC 3214

Phone: + 61 3 5274 1336
Fax: +61 3 5274 9966

DESIGN OFFICES

New South Wales	61 2 8838 1055
Canberra	61 2 6128 1000
Queensland	61 7 3277 5110
Victoria & Tasmania	61 3 5274 1336
South Australia	61 8 8275 8000
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SPELFilter Hydrosystem 4.0

SPEL ENVIRONMENTAL
INTEGRATED WATER SOLUTIONS

Appendix 2 – Draft Treatment Train Maintenance Contract

AKS ENVIRONMENTAL SOLUTIONS

SPEL STORMWATER QUALITY TREATMENT DEVICE MAINTENANCE AGREEMENT

FOR

Collins Street Hotel
Located at 2-6 Collins St, Hobart

This Equipment Maintenance Agreement (the "Maintenance Agreement") is made and effective

[DATE],

BETWEEN: AKS Industries Australia Pty Ltd (the "Service Provider"), of
191 Station Street, Corio VIC 3214 (ABN: 88 151 483 984) hereafter known as AKS

AND: [EQUIPMENT OWNER] (the "Client"), of
[COMPLETE ADDRESS]

SUMMARY

This 10 year maintenance contract covers the maintenance of the SPEL Ecoceptor and the SPEL Hydrosystem at the Collins Street Hotel
Located at 2-6 Collins St, Hobart

Where the Client has requested the provision of maintenance and the Service Provider is willing to provide such services as per the terms of this agreement both parties agree to:

1. WARRANTY:

The standard warranty on the SPEL Ecoceptor and SPEL Hydrosystem is 12 months. Goods sold shall only have the benefit of a manufacturer's warranty if the purchaser has complied with the manufacturer's instructions in relation to installation, maintenance and operation of the said goods.
AKS also holds a 25 Years on the fibreglass construction (as per our warranty certificate).

2. MAINTENANCE CALLS:

Service Provider agrees to provide maintenance services of maintenance calls and interim calls as required at the installation address specified above on the equipment listed. All charges specified are those currently in effect and are subject to change only at the time of subsequent annual renewal. If the charges are increased, the Client may, as of the effective date of such increase, terminate this Agreement by written notice to the Service Provider. Otherwise, the new charges shall become effective upon the date specified in the renewal invoice. Client calls hereunder are restricted to the normal working hours of the Service Provider.

All service commenced outside of Service Provider's normal working hours will be charged at published rates for service time and expense only.

SPEL

3. SERVICES:

The following services are included:

Maintenance Summary

The SPEL treatment systems will be inspected in accordance with the respective Maintenance Manual procedures. The SPEL Hydrosystem change out maintenance process comprises the removal and replacement of each SPEL Hydrosystem cartridge and the cleaning of the silt out of the vault or manhole with a vacuum truck. In the event these works are required, Client will be notified accordingly. The AKS personnel that enter the tank [if necessary] will be trained in confined space entry

Life Cycle Cost (LCC) – The maintenance requirements for the Stormceptor and the Hydrosystem is very site specific and actually relates to the sediment load and sediment characteristics.

Maintenance Triggers

The basic activities included in the maintenance contract are as follows:

- Visual inspection of the vault and filter conditions annually
- If there is a silt build up, it needs to be vacuumed out accordingly
- TSS accumulation in the filters is what dictates the life cycle of individual filter.

Optimum performance of the equipment covered by this Agreement can be expected only if supplies provided by, or meeting the specifications of Service Provider are used. Service Provider shall have full and free access to the equipment to provide service thereon. If persons other than Service Provider's representatives perform maintenance or repairs, and as a result further work is required by Service Provider to restore the equipment to operating condition, such repairs will be billed at Service Provider's published time and material rates then in effect.

4. ANNUAL RATE FOR SERVICES:

ACTIVITY	FREQUENCY [subject to site characteristics]	VALUE [subject to CPI index]
SPEL Ecoceptor - Visual inspection for hydrocarbon and silt depth. **SPEL Hydrosystem** - Visual inspection for sediment accumulation	Year 1 & 2 - Every six months Year 3 - 10 - Annually	$250.00+GST per site visit for this project. The ten (10) year total for inspections is $3,000.00+GST
Silt Removal When required the SPEL Ecoceptor and SPEL Hydrosystem will need the silt vacuumed out. AKS will supply vacuum truck and labour to maintain the system.	This is dictated by silt condition on the site, detected through the site inspections. AKS have allowed for one (1) maintenance supervision per annum.	AKS supervision will be $375.00+GST / visit, additional equipment (Sucker truck ect) will be on a cost plus basis. The ten (10) year total for maintenance (excluding sucker truck) is estimated $3,750.00+GST
SPEL Hydrosystem replacement – allowance for one filter change out of each SPEL Hydrosystem throughout a 10 year period (If required)	We estimate the life of the SPEL Hydrosystem to be between 5 – 7 years, subject to silt condition on the site.	The replacement value is $3,495.00 per SPEL Hydrosystem inclusive of the labour, management and labour for the day
SUMMARY		
Based on the selection above the, annual rate is $1,024.50+GSTp.a. This comprises of the above inspection schedule, maintenance, filter replacement and associated reporting spread over the 10 year contract. The annual rate shall be paid in advance as at the renewal date each year. The annual rate shall be indexed by CPI at each annual renewal date (If applicable). Any payment not made by the 30th day of the month shall be considered overdue and in addition to Service Provider's other remedies, Service Provider may levy a late payment charge equal to 4% per month on any overdue amount.		

5. PAYMENTS:

For service as specified above on the equipment listed, the undersigned Client agrees to pay in advance the total annual charge specified below to Service Provider, in accordance with the terms specified on the face of the invoice.

There shall be added to the charges provided for in this Agreement amounts equal to any taxes, however designated, levied or based on such charges or on this Agreement, or on the services rendered or parts supplied pursuant hereto, including GST.

6. BINDING AGREEMENT:

The undersigned Client represents that he is the owner of the equipment, or that they have the owner's authority to enter into this agreement.

This Agreement is subject to acceptance by Service Provider. It takes effect on the date written above and continues in effect for ten years and will remain in force thereafter, with automatic annual renewal at the indexed rates, until cancelled in writing by either party or at the end of a 2 year period – whichever is earlier.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

AKS Industries Australia Pty Ltd
ACN 151 483 984

of 191 Station Street, Corio VIC 3214

CLIENT

_____	_____
Authorized Signature	Authorized Signature
_____	_____
Kurt Jensen – Environmental Division Manager	Client Print Name and Title

SPEL
191 Station Street
Corio VIC 3214
P 03 5274 1336 F 03 5274 9966
E sales@aksindustries.com.au
W aksindustries.com.au
ABN 88 151 483 984

Proposed Hotel
2-6 Collins Street, Hobart
Traffic Impact Assessment

transport | community | mining | industrial | food & beverage | carbon & energy



Prepared for:	Fragrance TAS-HOBART (Collins) Pty Ltd
Client representative:	Adrian Lim
Date:	14 June 2018 Rev 14

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Appendix E: Swept Paths

Prepared by: Leenah Ali Date: 14 June 2018

Reviewed by: Rebekah Ramm Date: 14 June 2018

Authorised by: Ross Mannering Date: 14 June 2018

Revision History					
Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	Traffic Impact Assessment	R. Giana	R. Mannering	R. Mannering	12/09/16
01	Traffic Impact Assessment (additional rooms)	R. Giana	D. Conley	R. Mannering	14/09/16
02	Traffic Impact Assessment (reduced floors)	R. Giana	R. Mannering	R. Mannering	29/09/16
03	Traffic Impact Assessment (minor amendment)	R. Giana	R. Mannering	R. Mannering	3/10/16
04	Traffic Impact Assessment (minor amendment)	R. Giana	R. Mannering	R. Mannering	18/10/16
05	Traffic Impact Assessment (reduced rooms)	R. Giana	R. Mannering	R. Mannering	15/02/17
06	Traffic Impact Assessment (plan amendments)	R. Giana	R. Mannering	R. Mannering	16/03/17
07	Traffic Impact Assessment (plan amendments)	R. Giana	R. Mannering	R. Mannering	20/04/17
08	Traffic Impact Assessment	R. Giana	R. Mannering	R. Mannering	17/08/17
09	Traffic Impact Assessment (plan amendment)	R. Giana	R. Mannering	R. Mannering	16/01/18
10	Traffic Impact Assessment (minor edits)	R. Giana	R. Mannering	R. Mannering	25/01/18
11	Traffic Impact Assessment (minor edits)	L. Ali	R. Ramm	R. Mannering	07/03/18
12	Traffic Impact Assessment (minor edits)	L. Ali	R. Ramm	R. Mannering	14/03/18
13	Traffic Impact Assessment (plan amendments and minor edits)	L. Ali	R. Ramm	R. Mannering	07/06/18
14	Traffic Impact Assessment (plan amendments and minor edits)	L. Ali	R. Ramm	R. Mannering	14/06/18

1. Introduction

It is understood that a Development Application is to be lodged with City of Hobart for a proposed hotel to be located at 2-6 Collins Street in Hobart. The proposed development is a 14-level hotel building which includes hotel rooms, a ground floor lobby, restaurant, retail, above ground car parking, a health centre and a conference centre.

Fragrance TAS-HOBART (Collins) Pty Ltd engaged **pitt&sherry** to undertake a Traffic Impact Assessment (TIA) for the development.

This report has been prepared in accordance with the Department of State Growth's *Framework for Undertaking Traffic Impact Assessments* and details the findings of the traffic assessment undertaken for the proposed development.

2. Existing Conditions

2.1 Site Location

The site is located at 2-6 Collins Street, on the corner of Collins Street and the Brooker Highway. The site is located within the boundary of the *Sullivan's Cove Planning Scheme 1997* and has a land use classification as 1.0 – Inner City Residential. The site is currently used as a car park.

Surrounding properties include a mixture of commercial, accommodation and medium/high density residential uses. The Old Woolstore Apartment Hotel is located directly to the south-east of the site. Several medium and high density residential buildings are located to the north, west and south of the site. The theatre Royal is located to the south-west of the site along with the proposed UTAS Performing Arts School.

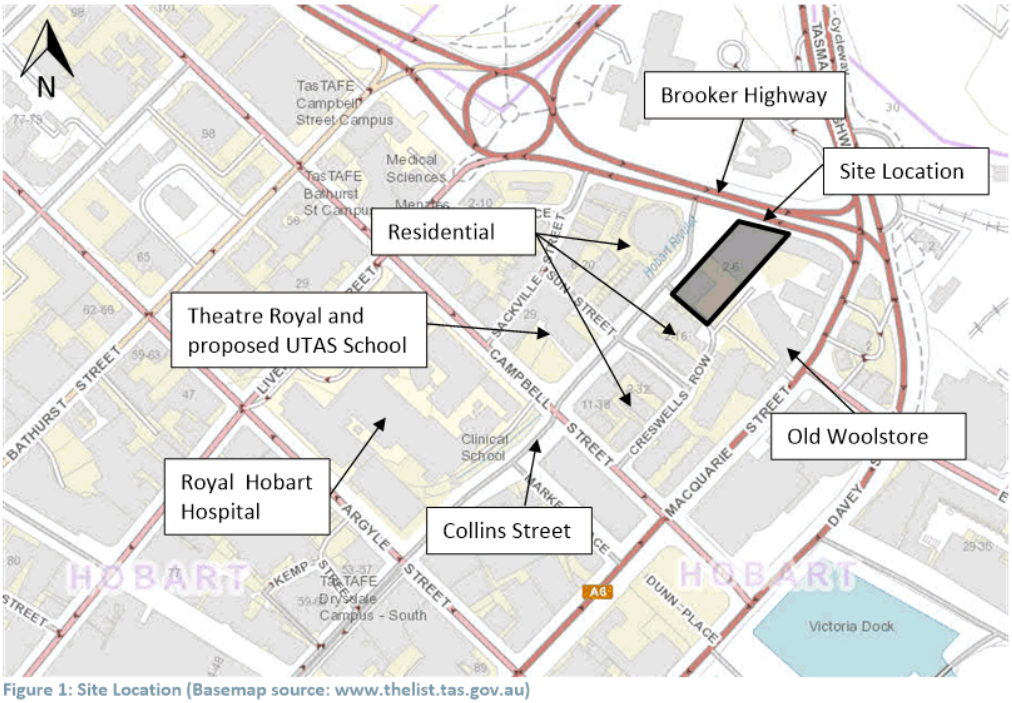


Figure 1: Site Location (Basemap source: www.thelist.tas.gov.au)

2.2 Surrounding Road Network

Collins Street

Collins Street (shown in Figure 2 and Figure 3) operates as a minor collector road and runs in a north-east/south-west direction. In the vicinity of the site it is a two-way street with one lane in each direction. Wide footpaths are located on both sides of the road, and 3hour meter parking is located along Collins Street which was observed to be about half full at the time of the site visit. Collins Street has a speed limit of 50km/h and carries approximately 3,000[1] vehicles per day.

Figure 2: Collins Street (facing north-east)

Figure 3: Collins Street (facing south-west)

Brooker Highway

Brooker Highway (shown in Figure 4 and Figure 5) is a Department of State Growth Category 1 Road under the State Road Hierarchy. In the vicinity of the site it is a two-way road, running in an east-west direction, with a split carriageway and two lanes in each direction (increasing to three lanes near traffic signals). Wide footpaths are located on both sides of the road. No parking is permitted on the Highway. Brooker Highway has a speed limit of 60km/h in the vicinity of the site and carries approximately 20,000[1] vehicles per day in the block directly outside the side.

Figure 4: Brooker Highway (facing west)

Figure 5: Brooker Highway (facing east)

[1]Traffic counts undertaken in July 2016 and assuming a peak-to-daily ratio of 10%.

Campbell Street

Campbell Street (shown in Figure 6 and Figure 7) is a major collector road and runs in a north-west/south-east direction. It is a one way street with three lanes travelling in a south-east direction. Campbell Street intersects with Collins Street approximately 130 metres south-west of the site. Campbell Street has a speed limit of 50km/h and carries approximately 10,000[2] vehicles per day.

Figure 6: Campbell Street (facing north-west)

Figure 7: Campbell Street (facing south-east)

2.3 Surrounding Intersections

The following intersections are located close to the site:

- Collins Street/Brooker Highway (sign controlled left in/left out intersection)
- Collins Street/Campbell Street (signalised intersection).

2.4 Traffic Volumes and Existing Intersection Operation

A traffic survey was undertaken by Matrix Traffic and transport data at the intersection of Collins Street and Brooker Highway during the following periods:

- Thursday 28 July 2016 7:30am – 9:30am
- Thursday 28 July 2016 4:00pm – 6:00pm.

SCATS data for the Collins Street/Campbell Street intersection was provided by the Department of State Growth. The data was collected in August 2016.

It was determined from the traffic data that the network AM peak hour occurs between 8:15am and 9:15am and the PM peak hour occurs between 4:30pm and 5:30pm.

The SCATS data also confirmed that the traffic volumes on weekends are significantly lower than weekday volumes.

To determine the 2018 volumes, a compound growth rate of 2% has been applied to the 2016 traffic volumes. A summary of the calculated 2018 AM and PM peak hour traffic volumes are shown in Figure 8 and Figure 9.

[2]Traffic Data supplied by the Department of State Growth.

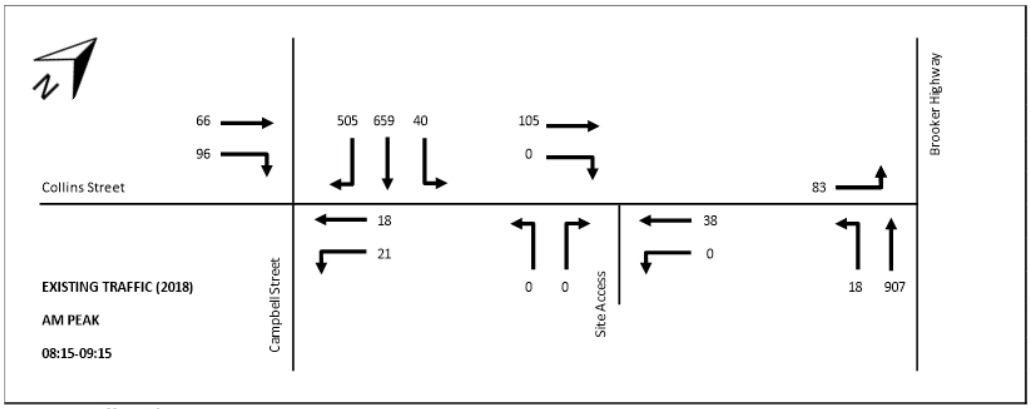


Figure 8: Traffic Volumes - Existing AM

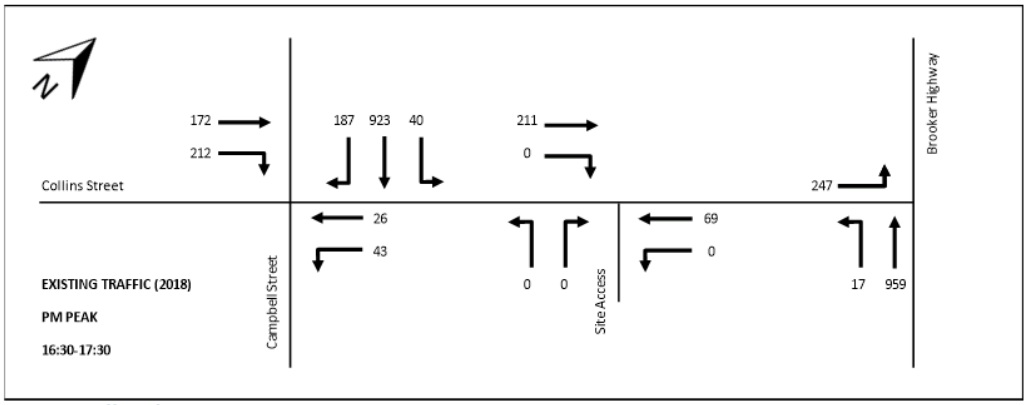


Figure 9: Traffic Volumes - Existing PM

The traffic operation at each of the intersections has been assessed using SIDRA INTERSECTION. The intersection performance is based on the vehicle delay and the corresponding Level of Service (LOS). It is generally accepted that an intersection operates well if it is at LOS D or higher. Table 1 shows the criteria that SIDRA intersection adopts in assessing the LOS.

Table 1: SIDRA INTERSECTION Level of Service Criteria

LOS	Delay per Vehicle (secs)		
	Signals	Roundabout	Sign Control
A	10 or less	10 or less	10 or less
B	10 to 20	10 to 20	10 to 15
C	20 to 35	20 to 35	15 to 25
D	35 to 55	35 to 50	25 to 35
E	55 to 80	50 to 70	35 to 50
F	Greater than 80	Greater than 70	Greater than 50

It is noted that pedestrian volumes have also been considered in the SIDRA intersection modelling but would have minimal impacts on the traffic operation. The signalised intersections have been modelled to run pedestrian movements during all traffic signal phases which would be a 'worst case' scenario.

The pedestrian volumes for the unsignalised intersections have been modelled at a minimum of 50 pedestrian movements on each leg, which is significantly higher than the majority of the existing volumes; this is to allow for variations.

Table 2 presents a summary of the existing operation of the intersections, with full results presented in Appendix A.

Table 2: Existing Operating Conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (secs)	95th Percentile Queue (m)	LOS
Collins Street/ Brooker Highway	AM	South	0.08	8	2.7	A
		East	0.26	0	0.0	A
		All Vehicles	**0.26**	**1**	**2.7**	**A**
	PM	South	0.26	8	9.2	A
		East	0.27	0	0.0	A
		All Vehicles	**0.27**	**2**	**9.2**	**A**
Collins Street/ Campbell Street	AM	North-East	0.08	22	6.7	C
		North-West	0.26	9	30.4	A
		South-West	0.26	23	18.0	C
		All vehicles	**0.26**	**12**	**30.4**	**B[1]**
	PM	North-East	0.11	18	10.6	B
		North-West	0.48	14	62.4	B
		South-West	0.47	20	39.2	B
		All vehicles	**0.48**	**15**	**62.4**	**B[1]**

[1] The intersection has been modelled as a stand-alone intersection in SIDRA and therefore the LOS does not take into account queuing from the Macquarie Street/ Campbell Street intersection

It was observed during both peak hours that vehicles queue back in the Campbell Street left lane from the Campbell Street/Macquarie Street intersection due to the long green time given to Macquarie Street and the large number of left turners from Campbell Street into Macquarie Street.

In the majority of phases witnessed in both peak hours, vehicles waiting on Campbell Street at Macquarie Street were able to clear to allow vehicles at the Collins Street/Campbell Street intersection to move on during the current green cycle. On the few occasions that vehicles that did not clear the intersection on the first green cycle, they were easily able to clear the intersection on the second. This resulted in a delay of less than a minute.

On the basis of the above assessment it is clear that each of the intersections operate satisfactorily with acceptable queues and delays on all approaches.

2.5 Public Transport

Metro Tasmania operates bus services in the vicinity of the site. Campbell Street, located a 3minute walk from the site, is well serviced by buses travelling to the CBD and eastern shore with services departing frequently during peak times. The Hobart Bus Mall is located approximately 7 minutes walking distance from the site with bus services to all parts of Hobart departing frequently during peak times.

2.6 Pedestrian and Cycling Facilities

The site is located in a very pedestrian friendly area with pedestrian paths located on both sides of the road in the vicinity of the site. Pedestrian signals are provided at all signalised intersections in the vicinity.

There are no bicycle paths currently located on Collins Street, Brooker Highway or Campbell Street. The Hobart intercity cycleway can be accessed from Davey Street approximately 3 minutes walking distance from the site.

2.7 Crash History

The Department of State Growth has provided crash history information for Collins Street between Campbell Street and Brooker Avenue for the most recent five-year period. No crashes were recorded on Collins Street between the intersections. Three pedestrian-vehicle crashes and one rear-end crash were recorded at the intersection of Collins Street and Campbell Street and three left-rear crashes at the intersection of Collins Street and Brooker Avenue. Each of these crashes resulted in a minor injury or property damage only. The crash history generally represents typical crash patterns for intersections with high traffic volumes, high pedestrian volumes and low speeds.

The impact of the development on the crash risk is discussed in Section 4.6.2.

3. Development Proposal

3.1 Overview

The proposed development involves the construction of a 16-storey hotel building. The hotel building will fill the entire site. The building will have a floor area breakdown as shown in Table 3.

Table 3: Floor Area Breakdown

Floor	Use	Floor Area	Traffic/ Parking Generating
Ground Floor (Level 0)	Breakfast Restaurant and cafe	392m^2	Yes
	Restaurant (separate tenancy)	127m^2	Yes
	Retail	38m^2	Yes
	Business Centre	18m^2	Yes
	Lobby, hotel lounge, back office, kitchen etc.	1,219m^2	No
Level 1	Conference Centre	2,302m^2	Yes
Level 1A	Storage and Administration	816m^2	No
Level 2 – Level 4	Car Park (167 spaces)	6,655m^2	No
Level 5	Podium	-	No
Level 6	Pool and Wellbeing	1,428m^2	Yes
Level 7 – Level 14	Hotel (256 rooms*)	11,360m^2	Yes
Level 15	Rooftop	584m^2	No

*Includes 240 1-bedroom, 8 2-bedroom, 8 3-bedroom hotel rooms

The development also involves the demolition of all existing buildings on the site and a minimum of one street tree. The proposed site plans are shown in Appendix B.

3.2 Vehicle Access

All vehicle access to the site will be from Collins Street.

The car park and loading and coach bays will be accessed by a driveway crossover at the south-west corner of the site. The two-way driveway is 12.2m wide in total including a 6m entry lane, a 5.2m exit lane and a 1m separation between the two lanes. A speed bump will be located in the exit lane to slow vehicles on approach to the Collins Street footpath.

It is proposed to add 2 parallel car parking spaces on Collins Street to the east of the existing parallel bus bay. It is understood that these parking spaces will not be required specifically for hotel parking as there is parking available on-site. Some of these spaces could potentially be used for short-term (less than 5-minute stopping) pick up and drop off at the hotel.

3.3 Footpath

A footpath will be located along the site frontage for pedestrian access. The existing footpath will be upgraded to suit the proposed development and maintain ample pedestrian access.

3.4 Car Parking

The proposal includes provision for 167 car parking spaces including 5 DDA spaces and 9 small car spaces.

The suitability of the car parking provision is discussed in Section 4.2.

3.5 Service Vehicle and Coach Parking

Service vehicles and coaches will park adjacent to the service lift. They will access the site from the two-way driveway.

The suitability of the loading and coach parking spaces are discussed in Section 4.5.

4. Transport Assessment

4.1 Vehicle Access

The vehicle access widths have been reviewed against the *Sullivan's Cove Planning Scheme 1997* and *Australian Standard for Off Street Parking (AS/NZS2890.1:2004 and AS 2890.6:2009).* Vehicle access has been assessed for a parking facility of User Class 3, determined from Table 1.1 of AS2890.1:2004.

In order to determine the access facility category and for access driveway widths, Table 3.1 and Table 3.2 of the Australian Standard have been reviewed.

Table 3.1 shown in Figure 10 shows that a User Class 3 parking facility with 167 parking spaces can be classed as Category 3 or Category 4 depending on the frontage road. The proposed car park is accessed from Collins Street which is a local road. As such, the proposed parking facility is categorised as Category 3.

Class of parking facility (see Table 1.1)	Frontage road type	Access facility category				
		Number of parking spaces (Note 1)				
		<25	25 to 100	101 to 300	301 to 600	>600
1,1A	Arterial	1	2	3	4	5
	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3,3A	Arterial	2	3	4	4	5
	Local	1	2	3	4	4

Figure 10: Table 3.1 from Australian Standard AS2890.1:2004

metres

Category	Entry width	Exit width	Separation of driveways
1	3.0 to 5.5	(Combined) (see Note)	N/A
2	6.0 to 9.0	(Combined) (see Note)	N/A
3	6.0	4.0 to 6.0	1 to 3
4	6.0 to 8.0	6.0 to 8.0	1 to 3
5	To be provided as an intersection, not an access driveway, see Clause 3.1.1.		

Figure 11: Table 3.2 from Australian Standard AS2890.1:2004

Table 3.2 shown in Figure 11 shows that for a Category 3 parking facility, an entry width of 6.0m and an exit width of 4.0 – 6.0m is required. A separation of 1.0m to 3.0m is required between the two driveways.

Based on the above, the 6m entry lane, 5.2m exit lane and the 1m separation between the two driveways meets the requirements of the Australian Standard.

4.2 Car Parking

4.2.1 Car Parking Requirements

The *Sullivan's Cove Planning Scheme 1997* specifies that a minimum of 3 car parking spaces per 100m^2 of floor area are required at the site location for all non-residential uses. Therefore, the entire hotel development would be covered by this car parking requirement.

Based on the floor areas in Table 3, the total floor area that would generate traffic to require parking is 15,665m^2. This would result in the requirement for 471 car parking spaces as shown in Table 4.

Table 4: Planning Scheme Car Parking Requirement

Floor	Use	Floor Area	Parking Generating	Car Parking Requirement
Ground Floor	Breakfast Restaurant and cafe	392m^2	Yes	12 spaces
	Restaurant (separate tenancy)	127m^2	Yes	4 spaces
	Retail	38m^2	Yes	1 space
	Business Centre	18m^2	Yes	1 space
	Lobby, hotel lounge, back office, kitchen etc.	1,219m^2	No	0 spaces
Level 1	Conference Centre	2,302m^2	Yes	69 spaces
Level 1A	Storage and Administration	816m^2	No	0 spaces
Level 2 – Level 4	Car Park (167 spaces)	6,655m^2	No	0 spaces
Level 6	Pool and Wellbeing	1,428m^2	Yes	43 spaces
Level 7 – Level 14	Hotel (256 rooms)	11,360m^2	Yes	341 spaces
Level 15	Rooftop	584m^2	No	0 spaces
TOTAL				**471 spaces**

This car parking requirement is considered high for this development based on the following:

- The parking requirement for the hotel has been calculated to be 471 spaces or 1.83 spaces per room, this is significantly higher than the requirement specified in the RMS Guide to Traffic Generating Developments (2002) which specifies an indicative parking rate of 1 space per 4 bedrooms for a 3 or 4 star hotel
- Some of the floor areas would operate ancillary to each other, i.e. hotel patrons would visit the restaurant, conference centre and pool and wellbeing centre
- The development is located close to buildings that are exempt from providing parking, the development is also located approximately 200 metres from the Hobart Central Business zone which is also exempt from minimum parking requirements
- The site is located within a close distance to regular bus services, taxis are also readily available in the area
- There is good pedestrian infrastructure in place on all streets within close proximity to the site
- The majority of people accessing the development would be visitors to the hotel and to Hobart, the hotel development is located within walking distance to many major attractions including Salamanca, the waterfront and the Hobart CBD
- Tourists to Hobart have several options for transport located in close proximity including coaches which will be able to access the site, the Hop On/Hop Off bus and the airporter shuttle bus. The Mona ferry is located within walking distance as are buses and taxis
- There are several off-street car parking facilities located in the vicinity of the site which could be used to house overflow guest vehicles, many hotels use this arrangement. These car parks can also be used by the general public. On-street car parking is available on the streets surrounding the site.

Based on the above, the following assumptions have been made:

- 80% of the breakfast restaurant and café patrons would be expected to stay at the hotel resulting in 20% of the parking requirement
- 50% of the restaurant patrons would be expected to stay at the hotel
- 50% of the conference centre users, retail visitors, business centre users and pool and wellbeing users would be expected to be already staying at the hotel or within walking distance, resulting in half the parking requirement
- The hotel parking requirement has been assumed as 1 space per 4 bedrooms to align with the RMS recommendation

This results in the car parking requirement shown in Table 5.

Table 5: Revised Car Parking Requirement

Floor	Use	Floor Area	Parking Generating	Reduction	Car Parking Requirement
Ground Floor	Breakfast Restaurant	334m^2	Yes	80%	3 spaces
	Restaurant (separate tenancy)	127m^2	Yes	50%	2 spaces
	Retail	45m^2	Yes	50%	1 space
	Business Centre	35m^2	Yes	50%	
	Lobby, hotel lounge, back office, kitchen etc.	1,420m^2	No	-	0 spaces
Level 1	Conference Centre	2,296m^2	Yes	50%	35 spaces
Level 2 – Level 4	Car Park (165 spaces)	6,655m^2	No	-	0 spaces
Level 6	Pool and Wellbeing	1,424m^2	Yes	50%	22 spaces
Level 7 – Level 14	Hotel (256 rooms)	11,360m^2	Yes	As per RMS	85 spaces
Level 22	Rooftop	584m^2	No	-	0 spaces
TOTAL					**147 spaces**

Based on the above, the parking supply of 167 spaces is expected to be adequate for the development including ancillary activities to the hotel.

The supply of 5 DDA spaces is in excess of the requirements of the Building Code of Australia.

4.3 Car Park Layout Review

The car parking layout has been reviewed against the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and ASNZS 2890.6:2009) User Class 3 requirements.

The requirements for car park dimensions are specified in Table 6.

Table 6: Car Parking Layout Requirements

Feature	Minimum Requirement	Proposed
Parking Space Width (90 degree)	2.5m	2.5m
Parking Space Length (90 degree)	5.4m	5.4m
Parking Space Width (parallel)	2.1m	2.1m
Parking Space Length (parallel)	5.9m	5.9m (7.5m between columns)
Small Parking Space Width	2.3m	2.4m
Small Parking Space Length	5.0m	5.0m
DDA Space Width	2.4m with a 2.4m shared space	2.5m with a 2.5m shared space
Parking Aisle Width	5.8m	5.9m
Circulation Road Width	5.5m (two-way) 3.0m (one-way)	5.8m (two-way) 3.0m (one-way)
Circulation Road Grade	1 in 5	1 in 5

Based on the dimensions in Table 6 the proposed car park dimensions meet the requirements of the Australian Standard.

The Australian Standard requires parking spaces to have no vertical obstructions closer than 300mm in order to provide manoeuvring clearance. As such, it is recommended that parking spaces 1 and 2 on level 2 be rearranged to allow for a 300mm clearance from the building columns.

The placement of the parallel car parking spaces on level 4 is not encouraged. These spaces are located parallel to the direction of travel of vehicles exiting the car park and drivers exiting the car park would generally not be looking for a space. This arrangement could lead to drivers reversing into these spaces in the opposite direction than they were intended. However, as it is noted that there are only 2 spaces that are in this arrangement, they are not expected to have a significant impact on traffic. It is however recommended that these spaces be used for overflow parking or reserved valet parking and have a requirement to be accessed by vehicles moving down the car park.

It is recommended that a kerb or similar protection treatment is placed adjacent to each of the columns near the 2 parallel parking spaces on level 4 to ensure vehicles do not drive or reverse directly into the columns. There is sufficient space between the columns for this.

It is further recommended that bollards or a similar protection treatment be applied along the circulation roadway to protect building columns from damage by vehicles. These protective devices should be clearly visible to drivers when they are in their normal driving position.

The parallel parking spaces at 6.3m in length and 2.1m in width will be adequate on Collins Street at the site frontage in accordance with the Australian Standards.

The existing loading zone space on Collins Street outside the site will remain as requested by Council. This space is not required for the operation of the hotel which can accommodate all bus parking on site.

4.4 Traffic Impact Assessment

4.4.1 Traffic Generation

The *RMS Guide to Traffic Generating Development* does not state traffic generation rates for hotels. Therefore, the traffic generation of the hotel has been sourced from the ITE *Trip Generation Manual*. The ITE manual states a hotel as the following:

"Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room) and/or other retail and service shops".

Based on that statement, the description from the ITE manual is consistent with the proposed development and therefore the ITE rate would be sufficient for determining the traffic generation.

Estimates of peak hourly traffic volumes resulting from the proposed development are set out in Table 7.

Table 7: Estimated Traffic Generation

Use	Size	Design Traffic Generation Rate		Traffic Generation [1]	
		AM Peak	PM Peak	AM Peak	PM Peak
Hotel	256 rooms	0.67 trips per occupied room	0.70 trips per occupied room	172 trips	179 trips

[1] Assuming 100% occupancy.

Table 7 indicates that the development could be expected to generate 172 and 179 vehicle movements in a weekday AM and PM peak hour respectively. This figure is expected to be conservative due to the location of the site close to the Hobart CBD, restaurants, the Hobart waterfront and Salamanca.

pitt&sherry is aware of the UTAS Performing Arts School development on the corner of Campbell and Collins Street. This development has not been considered in this report for traffic and car parking impacts as it is understood the development would not have any parking and students will be encouraged to travel to the site by public transport, walking and cycling.

4.4.2 Traffic Distribution and Assignment

Directional Split

The following directional split of traffic (i.e. the ratio between inbound and outbound traffic movements) has been adopted based on directional splits recorded in the ITE *Trip Generation Manual*:

- AM Peak 55%in/ 45% out
- PM Peak 57%in/ 43% out.

Traffic Distribution and Assignment

The distribution of traffic generated by the development is based on a number of factors including:

- The location of major traffic distributing roads around the site
- The location of traffic generating developments
- Existing traffic patterns.

Based on this, the expected traffic distribution to the study intersections is shown in Figure 12.

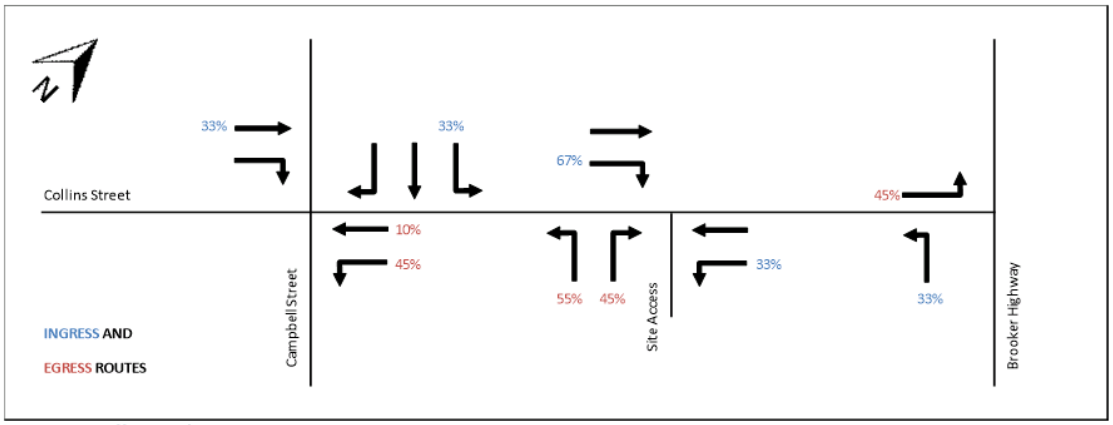


Figure 12: Traffic Distribution

4.4.3 Traffic Impact

The traffic impacts for the post development (2018) scenario and the 10 years post development scenario (2028) have been determined. In order to represent the future growth in the area, a compounding growth rate of 2% per year has been applied to the existing traffic volumes. The growth rate has not been applied to the trips generated by the new development as it is not expected to be made larger in the future and therefore the traffic generation would not be expected to increase significantly.

It is noted that the traffic generation from the existing car park site is expected to be low and therefore was not removed from the road network. The traffic impacts would therefore represent a conservative estimate of traffic operation post development.

The post development and 10 years post development traffic volumes for each of the peak periods are shown in Figure 13 to Figure 16.

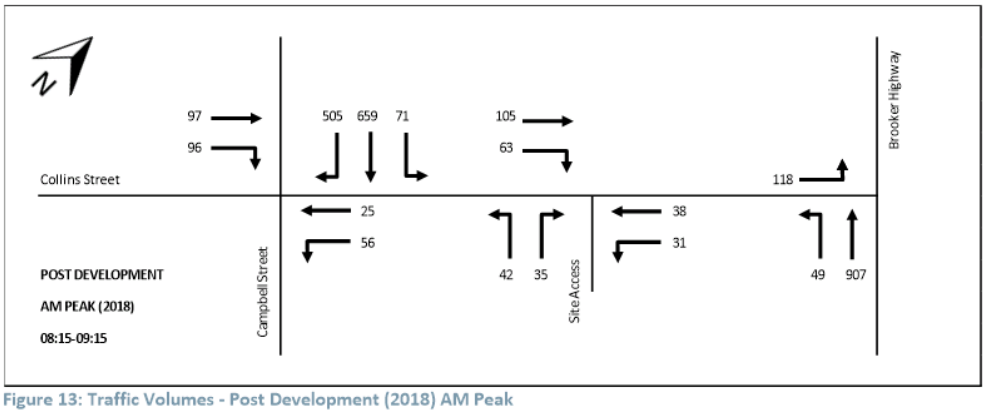


Figure 13: Traffic Volumes - Post Development (2018) AM Peak

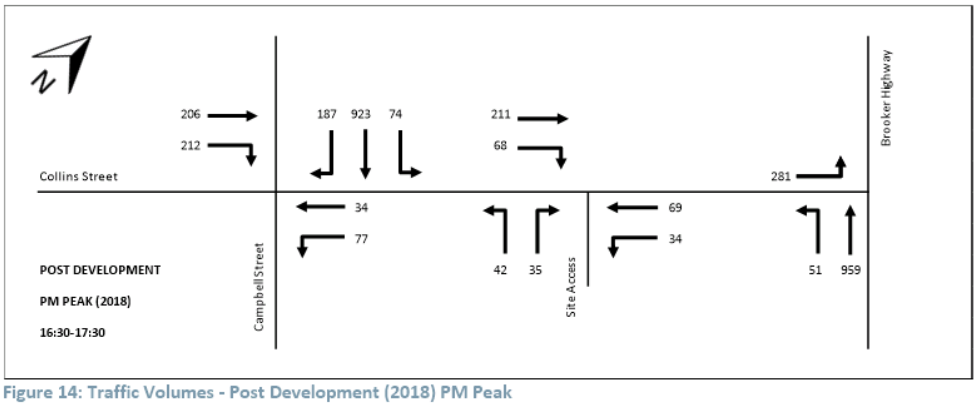


Figure 14: Traffic Volumes - Post Development (2018) PM Peak

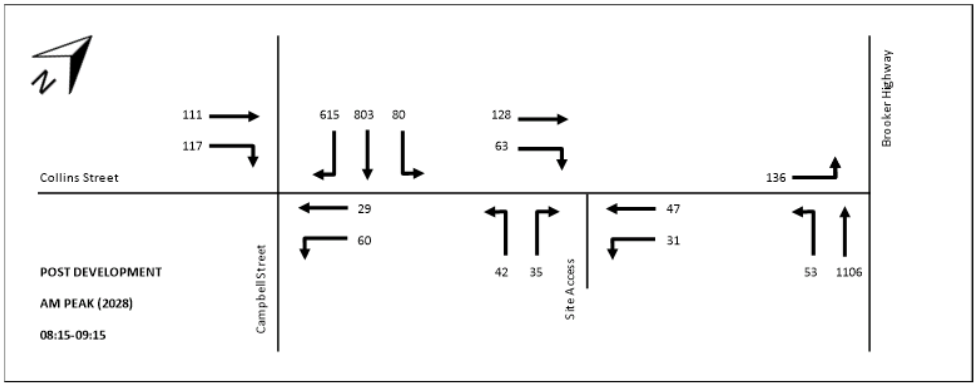


Figure 15: Traffic Volumes - Post Development (2028) AM Peak

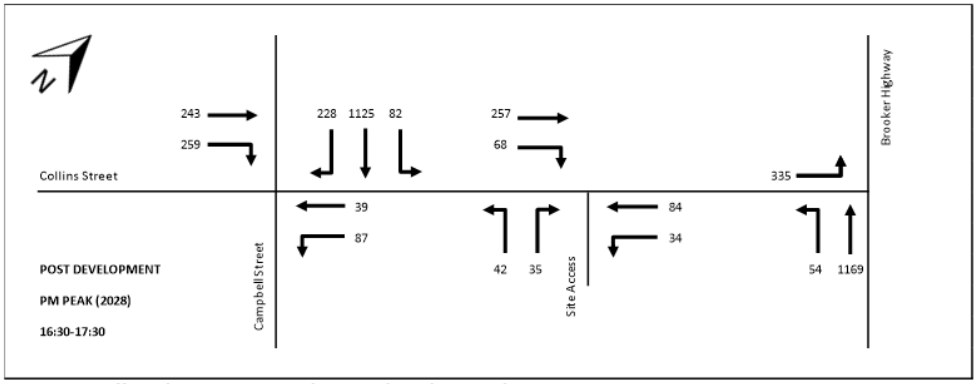


Figure 16: Traffic Volumes - Post Development (2028) PM Peak

Post Development (2018)

The impact of the hotel development on the study intersections has been assessed using SIDRA intersection. On the basis of the traffic generation rates and distributions presented above, the anticipated operation of the surrounding intersections immediately post development is summarised in Table 8. Detailed results of the SIDRA analysis are provided in Appendix C.

Table 8: Post Development (2018) Operating Conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (secs)	95th Percentile Queue (m)	LOS
Collins Street/ Brooker Highway	AM	South	0.12	8	3.9	A
		East	0.27	0	0.0	A
		All Vehicles	**0.27**	**1**	**3.9**	**A**
	PM	South	0.29	8	10.6	A
		East	0.28	0	0.0	A
		All Vehicles	**0.29**	**2**	**10.6**	**A**
Collins Street/ Campbell Street	AM	North-East	0.28	29	16.7	C
		North-West	0.48	9	62.9	A
		South-West	0.45	29	21.4	C
		All vehicles	**0.48**	**12**	**62.9**	**B[1]**
	PM	North-East	0.18	19	17.6	B
		North-West	0.50	14	64.9	B
		South-West	0.51	20	40.6	C
		All vehicles	**0.51**	**16**	**64.9**	**B[1]**
Collins Street/ Site Access	AM	South-East	0.07	6	1.8	A
		North-East	0.04	5	0.0	A
		South-West	0.13	5	4.8	A
		All vehicles	**0.13**	**5**	**4.8**	**A**
	PM	South-East	0.08	7	2.1	A
		North-East	0.06	5	0.0	A
		South-West	0.20	6	8.8	A
		All vehicles	**0.20**	**6**	**8.8**	**A**

[1] The intersection has been modelled as a stand-alone intersection in SIDRA and therefore the LOS does not take into account queuing from the Macquarie Street/Campbell Street intersection

Based on the results in the Post Development Operating Conditions (2018) table, the study intersections would be expected to operate at an acceptable LOS after the hotel development.

10 Years Post Development (2028)

The anticipated operation of the study intersections 10 years post development is summarised in Table 9. Detailed results of the SIDRA analysis are provided in Appendix D.

Table 9: Post Development (2028) Operating Conditions

Intersection	Peak	Leg	Degree of Saturation (DOS)	Average Delay (secs)	95th Percentile Queue (m)	LOS
Collins Street/ Brooker Highway	AM	South	0.15	8	5.0	A
		East	0.32	0	0.0	A
		All Vehicles	**0.32**	**1**	**5.0**	**A**
	PM	South	0.39	10	18.0	A
		East	0.34	0	0.0	A
		All Vehicles	**0.39**	**2**	**18.0**	**A**
Collins Street/ Campbell Street	AM	North-East	0.31	29	18.5	C
		North-West	0.59	9	84.9	A
		South-West	0.57	30	26.8	C
		All vehicles	**0.59**	**13**	**84.9**	**B[1]**
	PM	North-East	0.20	18	19.6	B
		North-West	0.63	16	86.6	B
		South-West	0.61	20	51.3	C
		All vehicles	**0.63**	**17**	**86.6**	**B[1]**
Collins Street/ Site Access	AM	South-East	0.07	6	1.9	A
		North-East	0.04	5	0.0	A
		South-West	0.14	5	5.6	A
		All vehicles	**0.14**	**5**	**5.6**	**A**
	PM	South-East	0.08	7	2.2	A
		North-East	0.07	5	0.0	A
		South-West	0.22	6	10.8	A
		All vehicles	**0.22**	**6**	**10.8**	**A**

[1] The intersection has been modelled as a stand-alone intersection in SIDRA and therefore the LOS does not take into account queuing from the Macquarie Street/ Campbell Street intersection

Based on the results in the Post Development Operating Conditions (2028), the study intersections would be expected to continue operating at an acceptable LOS 10 years after the hotel development.

4.5 Service Vehicles and Coach Parking

Swept path assessments have been undertaken for vehicle movements into the coach/ service bays. The swept paths were undertaken for the following vehicles:

- 12.5m long rigid bus – standard bus
- 8.8m delivery vehicle/minibus.

The 12.5m bus and 8.8m delivery vehicle/minibus are able to enter and exit the site in a forward direction in all directions. Large vehicles may momentarily cross the centreline when turning left into and out of the site. This is, however, not expected to have a significant impact on safety or operation of Collins Street outside the site as traffic speeds and volumes are low and sight distances are good. In addition, there is not expected to be a high volumes of large vehicles as a maximum of one 12.5m vehicle or two 8.8m vehicles could be accommodated on-site at any time.

Delivery vehicles and buses egressing the parking spaces will reverse into the path of traffic coming down the ramp from the car park above. As the reversing vehicles would be obstructed from the view of drivers coming down the ramp, a mirror should be installed at this location.

Due to the required turning space, buses can only enter the parking bay when there are no adjacent vehicles. The movements of these vehicles at different times will be managed by the hotel to ensure the coach/ service bay is empty when a bus is expected.

Swept paths for each of the vehicles are attached in Appendix E.

There is adequate space for two light vehicles entering the site to queue on-site while a large vehicle is manoeuvring into the coach/ service bays. As it is expected that manoeuvring of large vehicles into the coach/ service bays would take a short time, the two available vehicles spaces would be adequate and vehicles would not be expected to queue onto Collins Street.

4.6 Road Safety

4.6.1 Sight Distances

The Safe Intersection Sight Distance (SISD) at the proposed site access has been assessed against the requirements in the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections.* The SISD has been observed from a point 5 metres back from the edge of kerb in accordance with Figure 3.2 of the Austroads Guide.

The speed limit on Collins Street at the site access is 50km/h. The SISD requirement for a 50km/h road is 90m (with a reaction time of 1.5 seconds.

The sight distance to the west of the site was observed to the intersection of Collins Street and Campbell Street, or a distance of 130m. This is well in excess of the Austroads SISD requirement.

The sight distance to the east of the site was observed to the intersection of Collins Street and Brooker Avenue or a distance of 70m. This is less than the Austroads SISD requirement at 50km/h. Considering the Collins Street and Brooker Avenue intersection is 70m away from the site access, it is not expected that a vehicle would be travelling at 50km/h as it passes the site. The SISD requirement for a 40km/h road is 67m (with a reaction time of 1.5 seconds) which is lower than the sight distance available.

Based on the assessment above, the available sight distance at the site access location is expected to be adequate.

4.6.2 Crash Risk

As discussed in Section 2.7, the nearest crashes recorded in the vicinity of the proposed development were at the intersection of Collins Street and Campbell Street. These crashes were of low severity resulting in minor injuries or property damage only.

Increased pedestrian and vehicular traffic generated by the development to Collins Street and surrounding intersections is not expected to increase the severity of crashes in the vicinity. There is the potential for additional vehicular traffic to increase the risk of a low severity crash occurring between vehicles, however this is expected to be minor due to the existing high traffic volumes in the vicinity. Increased pedestrian volumes generally lead to a greater awareness of the presence of pedestrians from drivers. As such, it would not be expected that the crash risk for pedestrians would increase.

5. Conclusion

The proposed hotel located at 2-6 Collins Street has been assessed in accordance with the Department of State Growth's *Framework for Undertaking Traffic Impact Assessments*. The analysis and discussions presented in this report can be summarised as follows:

- The additional traffic generated by the development is not expected to have any significant impacts on the safety and operation on the surrounding road network for the post development and 10 years post development scenarios
- The development will provide a total of 167 car parking spaces, this is below the *Sullivan's Cove Planning Scheme 1997* requirement however is expected to be adequate for the development
- The entry lane width, exit lane width and separation between the exit and entry lane meets the requirements of the *Australian Standard for Off Street Car Parking AS2890.1*
- The multi-storey car park meets the requirements of the *Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009)*
- The coach/ service bays on the ground level are adequate for loading and unloading of delivery and passenger vehicles up to the size of a 12.5m long coach
- The new on-street car parking on Collins Street at the site frontage meets the requirements of the Australian Standards
- The existing on-street loading zone space has not been impacted by the hotel development.

Appendix A

SIDRA Intersection Results
Existing Operation

MOVEMENT SUMMARY

▽ Site: 102 [Collins Street/ Brooker Highway - Existing AM Peak (2018)]

08:15-09:15
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Collins Street											
1	L2	87	5.0	0.084	7.6	LOS A	0.4	2.7	0.48	0.65	51.9
Approach		87	5.0	0.084	7.6	LOS A	0.4	2.7	0.48	0.65	51.9
East: Brooker Highway											
4	L2	19	5.0	0.258	5.6	LOS A	0.0	0.0	0.00	0.02	57.9
5	T1	955	5.0	0.258	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		974	5.0	0.258	0.1	NA	0.0	0.0	0.00	0.01	59.8
All Vehicles		1061	5.0	0.258	0.8	NA	0.4	2.7	0.04	0.06	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: PITT & SHERRY CONSULTING ENGINEERS | Processed: Monday, 15 January 2018 1:29:28 PM
Project: J:\LAU\2016\101-150\LN16146\14P - Calculations\SIDRA\Collins-Brooker - Smaller Building.sip7

MOVEMENT SUMMARY

▽ Site: 102 [Collins Street/ Brooker Highway - Existing PM Peak (2018)]

16:30-17:30
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Collins Street											
1	L2	260	5.0	0.258	8.1	LOS A	1.3	9.2	0.55	0.72	51.5
Approach		260	5.0	0.258	8.1	LOS A	1.3	9.2	0.55	0.72	51.5
East: Brooker Highway											
4	L2	18	5.0	0.272	5.6	LOS A	0.0	0.0	0.00	0.02	57.9
5	T1	1009	5.0	0.272	0.0	LOS A	0.0	0.0	0.00	0.01	59.8
Approach		1027	5.0	0.272	0.1	NA	0.0	0.0	0.00	0.01	59.8
All Vehicles		1287	5.0	0.272	1.7	NA	1.3	9.2	0.11	0.15	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: PITT & SHERRY CONSULTING ENGINEERS | Processed: Monday, 15 January 2018 1:31:00 PM
Project: J:\LAU\2016\101-150\LN16146\14P - Calculations\SIDRA\Collins-Brooker - Smaller Building.sip7

MOVEMENT SUMMARY

Site: 101 [Collins Street/ Campbell Street - Existing AM Peak (2018)]

08:15-09:15
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Collins Street											
24	L2	22	5.0	0.084	23.7	LOS C	0.9	6.7	0.78	0.65	43.5
25	T1	19	5.0	0.084	18.1	LOS B	0.9	6.7	0.78	0.65	44.6
Approach		41	5.0	0.084	21.1	LOS C	0.9	6.7	0.78	0.65	44.0
NorthWest: Campbell Street											
27	L2	42	5.0	0.259	13.8	LOS B	4.1	30.1	0.58	0.53	50.8
28	T1	694	5.0	0.259	8.2	LOS A	4.2	30.4	0.58	0.51	52.5
29	R2	42	10.0	0.259	13.8	LOS B	4.1	30.1	0.58	0.53	50.2
Approach		778	5.3	0.259	8.8	LOS A	4.2	30.4	0.58	0.51	52.2
SouthWest: Collins Street											
31	T1	69	5.0	0.138	18.4	LOS B	1.6	11.5	0.80	0.61	46.1
32	R2	101	5.0	0.259	25.9	LOS C	2.5	18.0	0.84	0.77	40.7
Approach		171	5.0	0.259	22.9	LOS C	2.5	18.0	0.82	0.70	42.7
All Vehicles		989	5.2	0.259	11.7	LOS B	4.2	30.4	0.63	0.55	49.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	SouthEast Full Crossing	53	21.7	LOS C	0.1	0.1	0.85	0.85
P6	NorthEast Full Crossing	53	9.1	LOS A	0.0	0.0	0.55	0.55
P7	NorthWest Full Crossing	53	21.7	LOS C	0.1	0.1	0.85	0.85
P8	SouthWest Full Crossing	53	10.2	LOS B	0.1	0.1	0.58	0.58
All Pedestrians		211	15.7	LOS B			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Organisation: PITT & SHERRY CONSULTING ENGINEERS | Processed: Monday, 15 January 2018 1:33:53 PM
Project: J:\LAU\2016\101-150\LN16146\14P - Calculations\SIDRA\Collins-Campbell - Smaller Building.sip7

MOVEMENT SUMMARY

Site: 101 [Collins Street/ Campbell Street - Existing PM Peak (2018)]

16:30-17:30
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Collins Street											
24	L2	45	5.0	0.114	20.0	LOS B	1.5	10.6	0.71	0.66	45.3
25	T1	27	5.0	0.114	14.4	LOS B	1.5	10.6	0.71	0.66	46.4
Approach		73	5.0	0.114	17.9	LOS B	1.5	10.6	0.71	0.66	45.7
NorthWest: Campbell Street											
27	L2	42	5.0	0.483	18.3	LOS B	8.5	62.1	0.75	0.66	48.0
28	T1	972	5.0	0.483	12.7	LOS B	8.6	62.4	0.75	0.67	49.2
29	R2	197	10.0	0.483	18.3	LOS B	8.2	61.1	0.75	0.72	46.2
Approach		1211	5.8	0.483	13.8	LOS B	8.6	62.4	0.75	0.68	48.6
SouthWest: Collins Street											
31	T1	181	5.0	0.274	15.4	LOS B	3.9	28.3	0.76	0.62	47.9
32	R2	223	5.0	0.471	23.4	LOS C	5.4	39.2	0.84	0.81	41.9
Approach		404	5.0	0.471	19.8	LOS B	5.4	39.2	0.80	0.72	44.4
All Vehicles		1687	5.6	0.483	15.4	LOS B	8.6	62.4	0.76	0.69	47.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	SouthEast Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P6	NorthEast Full Crossing	53	12.1	LOS B	0.1	0.1	0.63	0.63
P7	NorthWest Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P8	SouthWest Full Crossing	53	13.4	LOS B	0.1	0.1	0.67	0.67
All Pedestrians		211	15.2	LOS B			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix B

Site Plans

Fragrance TAS-HOBART (Collins) Pty Ltd

2 - 6 Collins Street

Project No. J002192

Project Address: 02 - 06 Collins Street Hobart

Date: 14/03/2018

Issue: DA - V2

Level 1, 90-92 Murray Street,
Hobart Tasmania 7000
t. 03 6251 3906

Level 1, 10-14 Paterson Street
PO Box 1271 Launceston Tasmania 7250

w. www.sgroup.com.au
f. sgroupdesign

Sheet Number	Sheet Name	Current Revision	Current Revision Date
A01	Existing Conditions / Demolition	Nil	14/03/2018
A02	Site Plan	C	14/03/2018
A03	Ground Floor Plan	C	14/03/2018
A04	Cantilevers Facades	B	09/04/2018
A05	Storage & Administration	Nil	14/03/2018
A06	Carparking	B	09/04/2018
A07	Carparking	B	09/04/2018
A08	Carparking	B	09/04/2018
A10	Pool & Wellbeing	Nil	14/03/2018
A11	Hotel Rooms Levels	Nil	14/03/2018
A101	Collins Street Elevation	C	14/03/2018
A102	Southern Elevation	C	14/03/2018
A103	East Elevation	C	14/03/2018
A104	South West Elevation	C	14/03/2018
A105	Sections	C	14/03/2018
A200	Shadow Diagrams	Nil	14/03/2018
A201	Context Modelling	Nil	14/03/2018
A301	FECA Schedule	Nil	14/03/2018

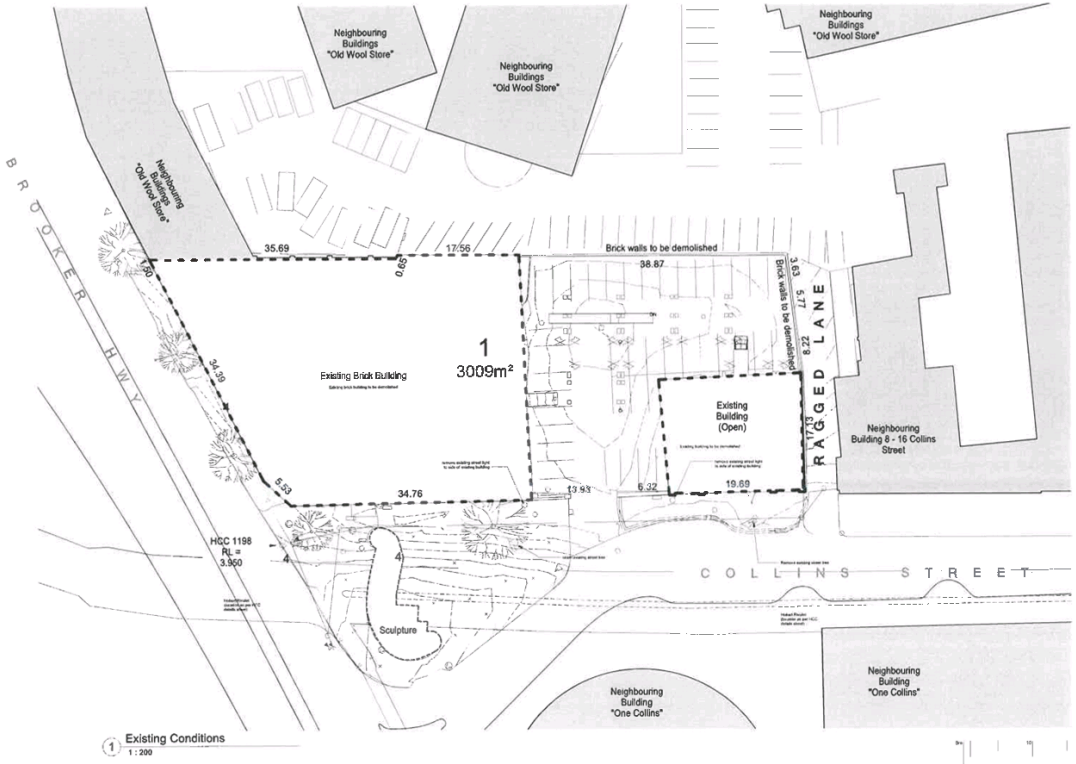
artists impression

architecture

development

strategic design

S.



1 Existing Conditions
1 : 200

2 Location Plan
1 : 2000

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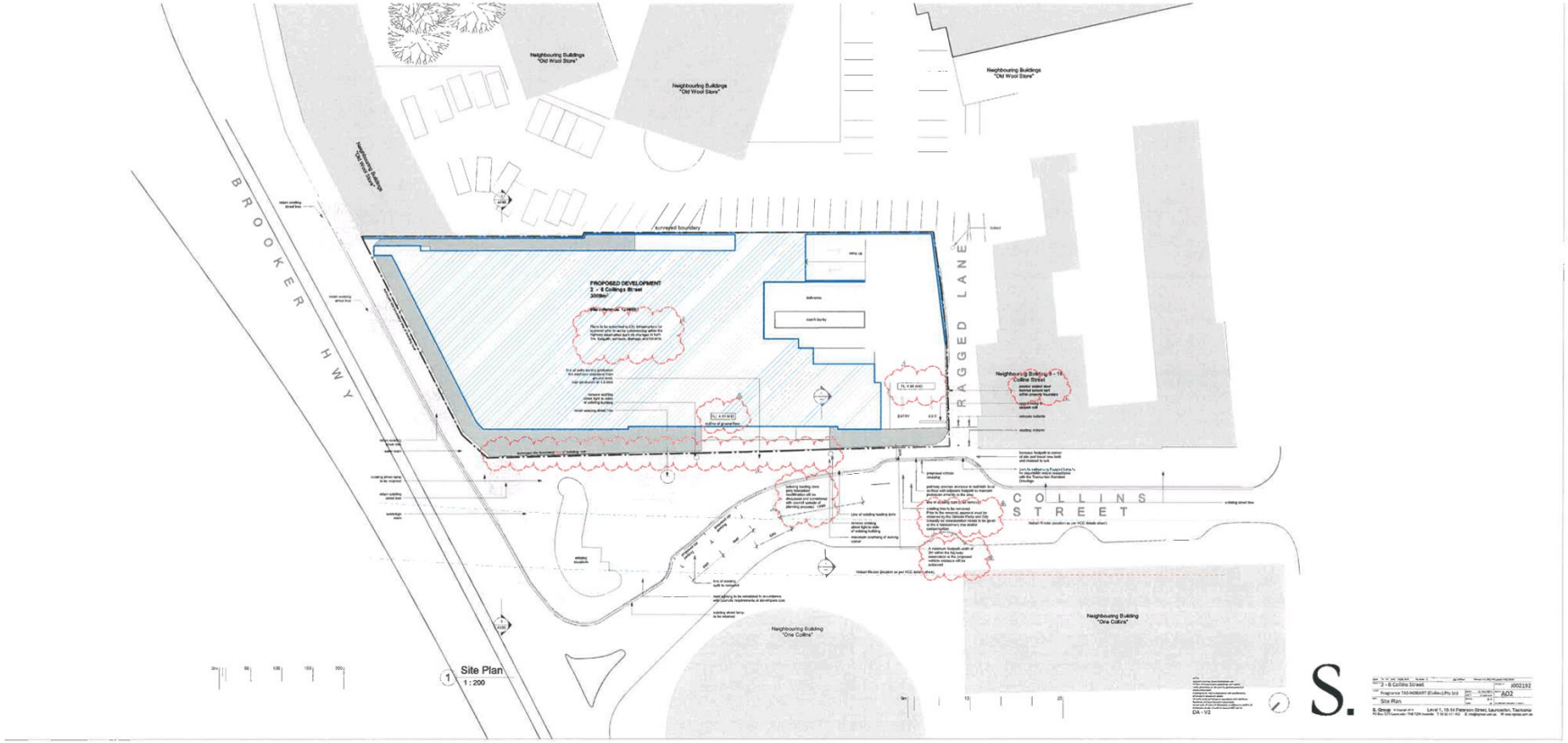
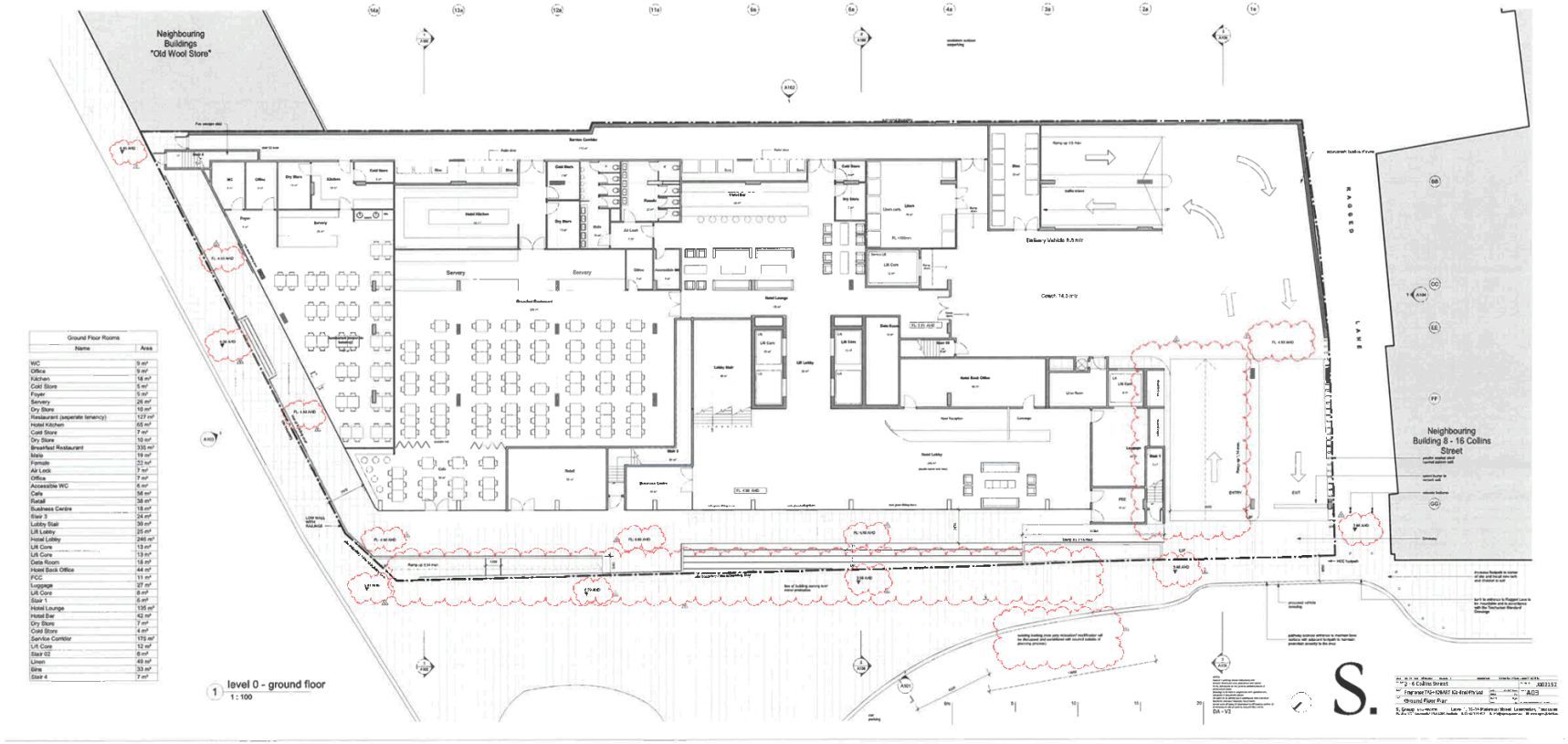
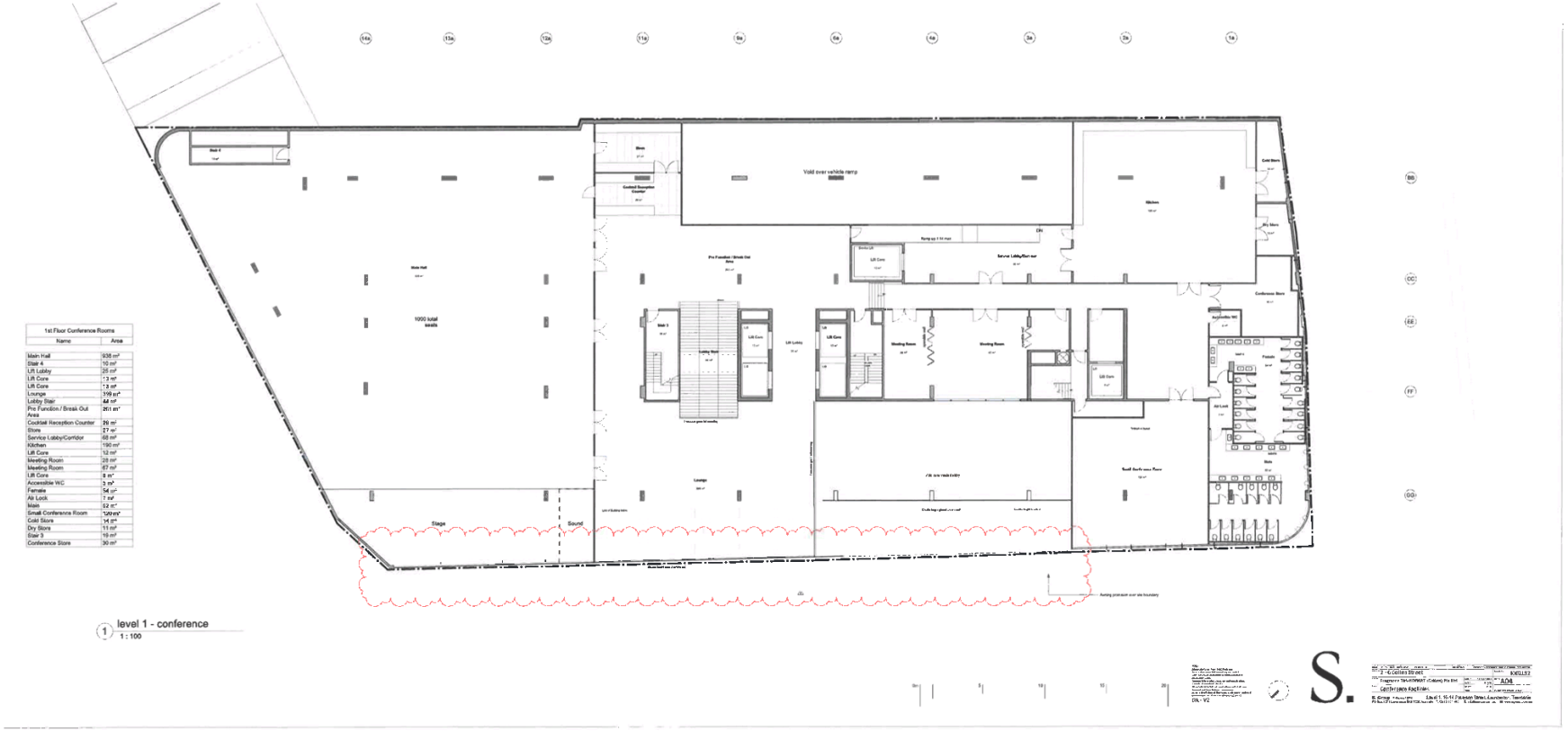
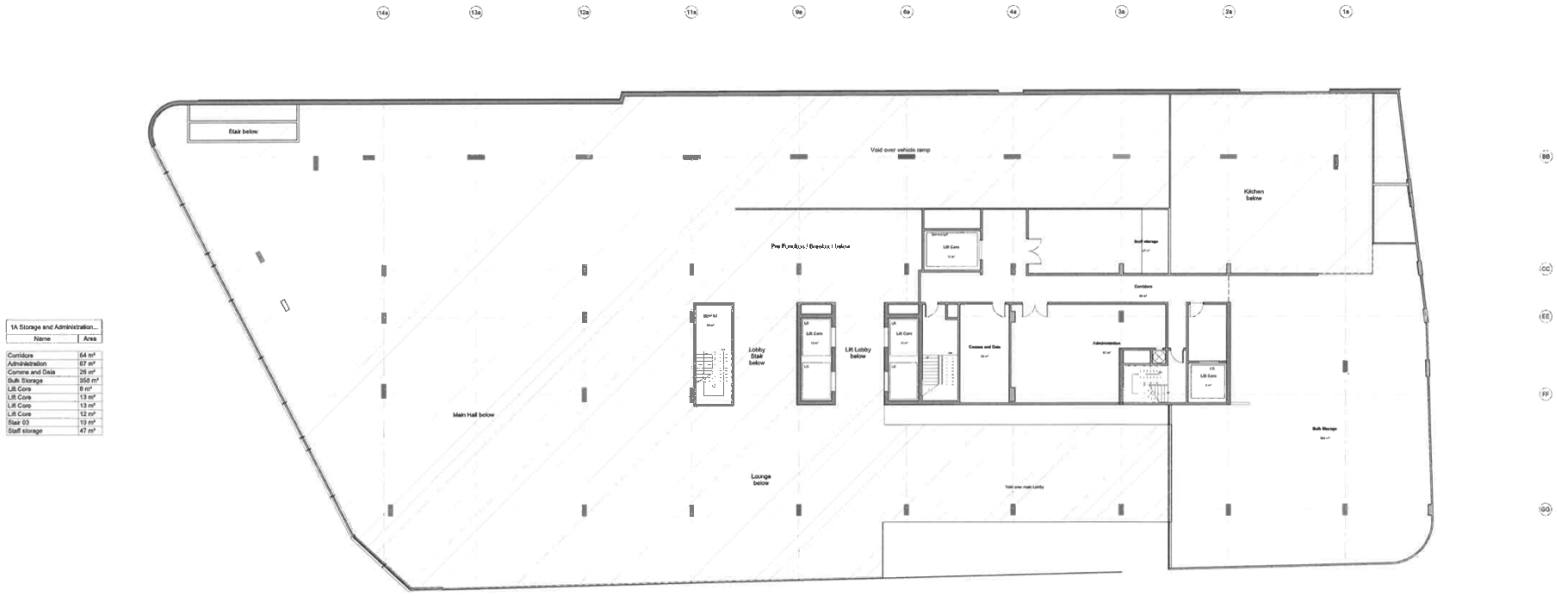

BROOKER HWY
RAGGED LANE
COLLINS STREET
Neighbouring Buildings "Old Wool Store"
Neighbouring Building "One Collins"
PROPOSED DEVELOPMENT
2 - 6 Collings Street
Site Plan
1 : 200

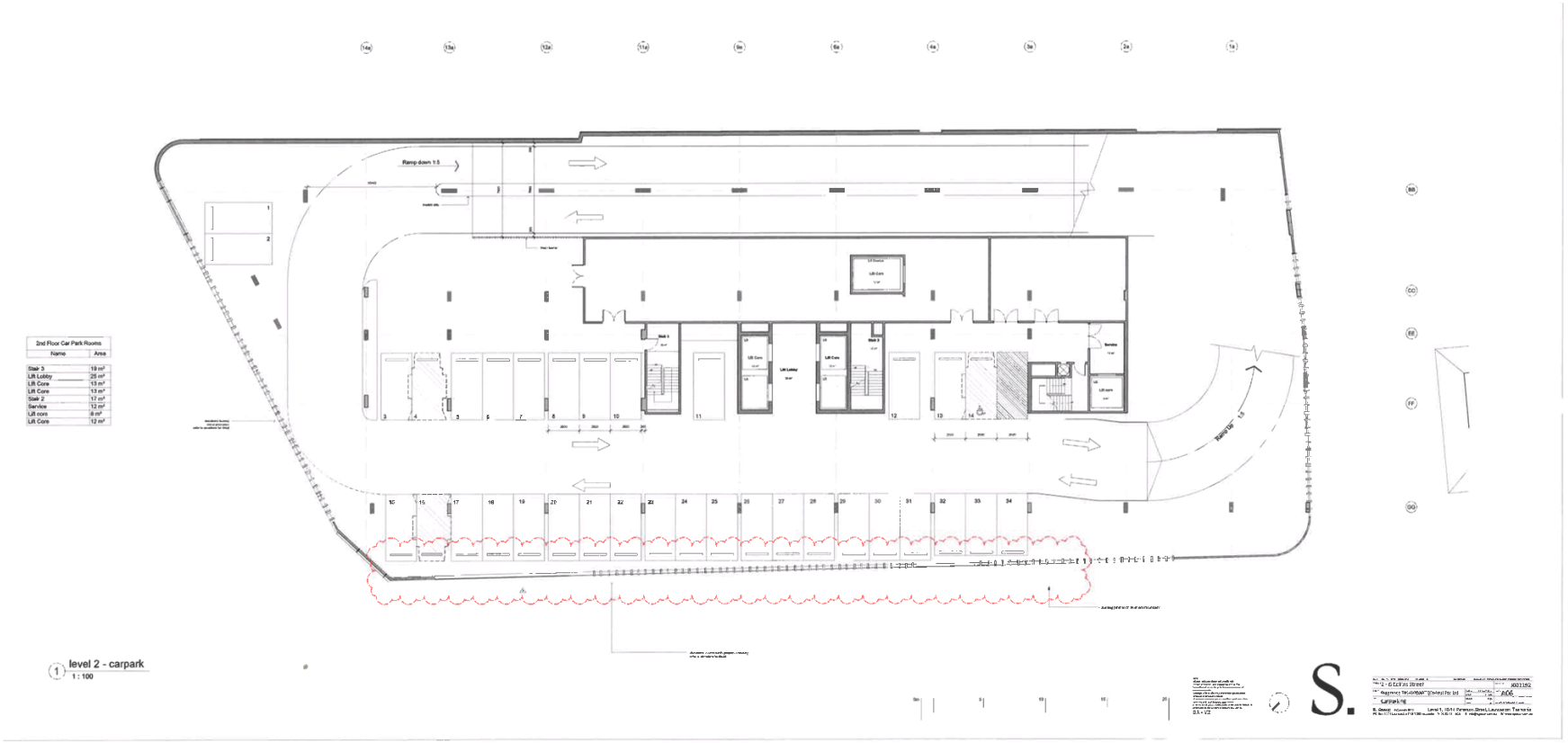

Neighbouring Buildings "Old Wool Store"
Neighbouring Building 8 - 16 Collins Street
HAGGED
LANE
Ground Floor Rooms
Name
Area
level 0 - ground floor
1 : 100

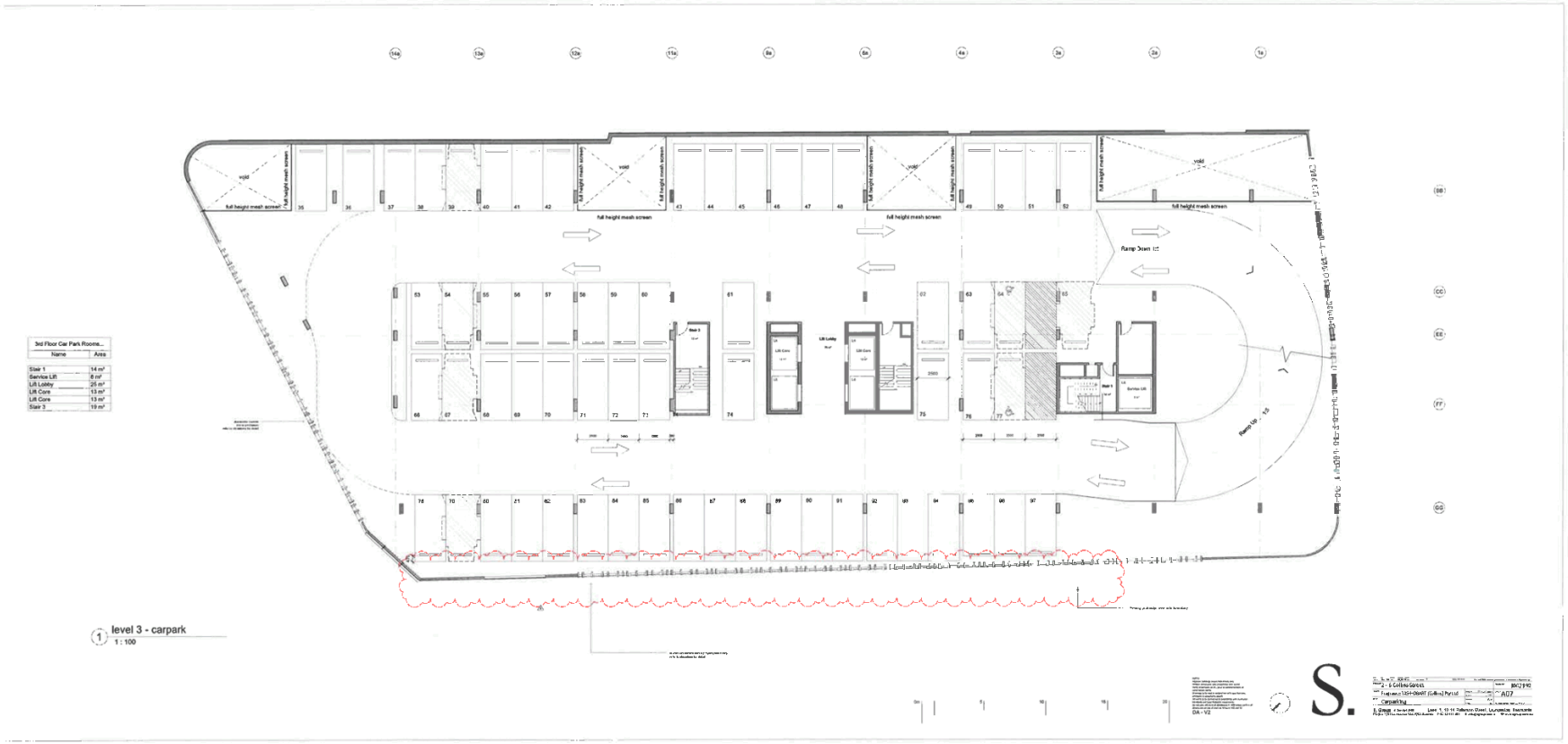

1st Floor Conference Rooms
Name
Area
Main Hall
935 m²
Stair 4
10 m²
Lift Lobby
25 m²
Lift Core
13 m²
Lift Core
13 m²
Lounge
199 m²
Lobby Stair
44 m²
Pre Function / Break Out Area
201 m²
Cocktail Reception Counter
26 m²
Store
27 m²
Service Lobby/Corridor
68 m²
Kitchen
190 m²
Lift Core
12 m²
Meeting Room
28 m²
Meeting Room
67 m²
Lift Core
8 m²
Accessible WC
3 m²
Female
54 m²
Air Lock
7 m²
Male
52 m²
Small Conference Room
120 m²
Cold Store
14 m²
Dry Store
11 m²
Stair 3
19 m²
Conference Store
30 m²
Void over vehicle ramp
1000 total seats
Stage
Sound
level 1 - conference
1 : 100

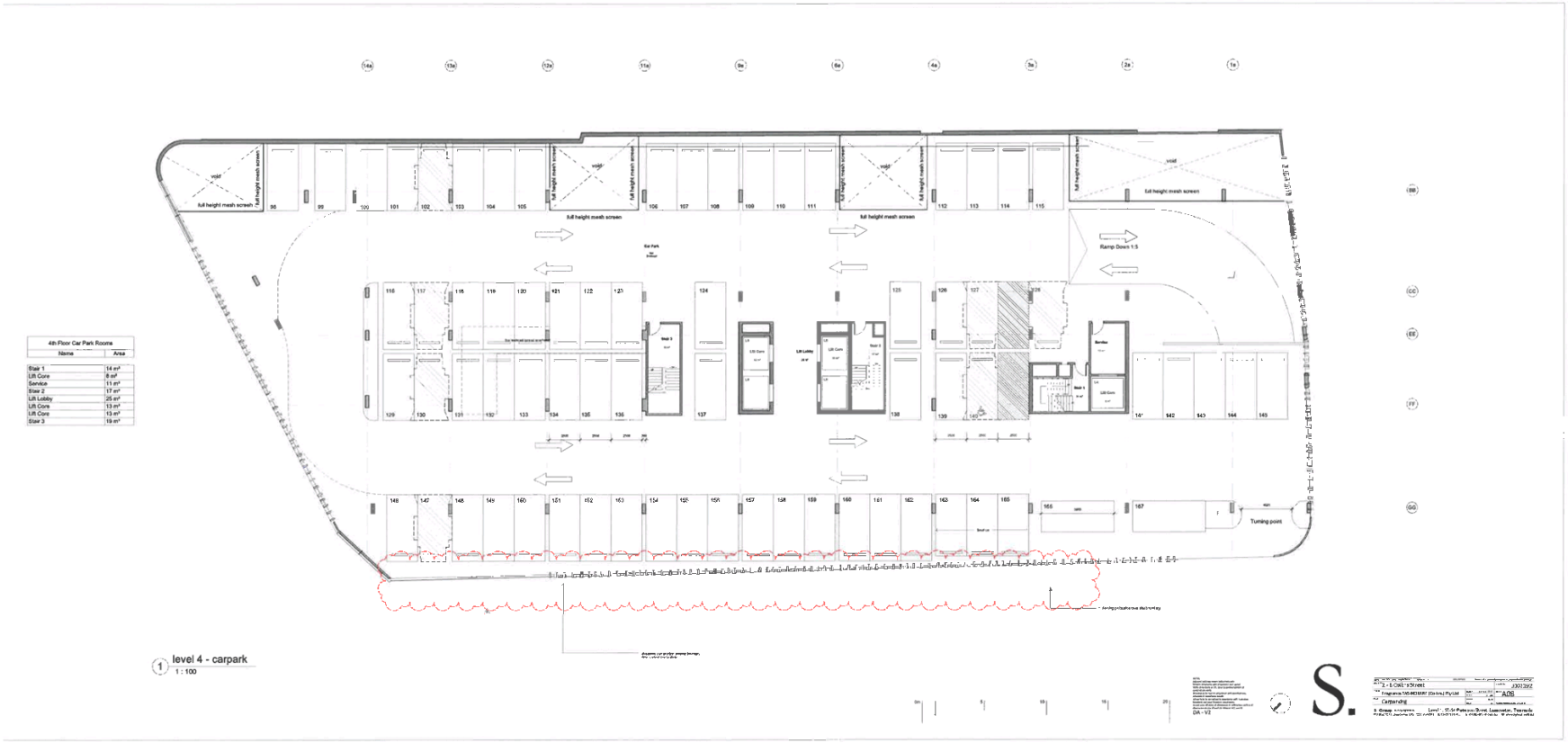


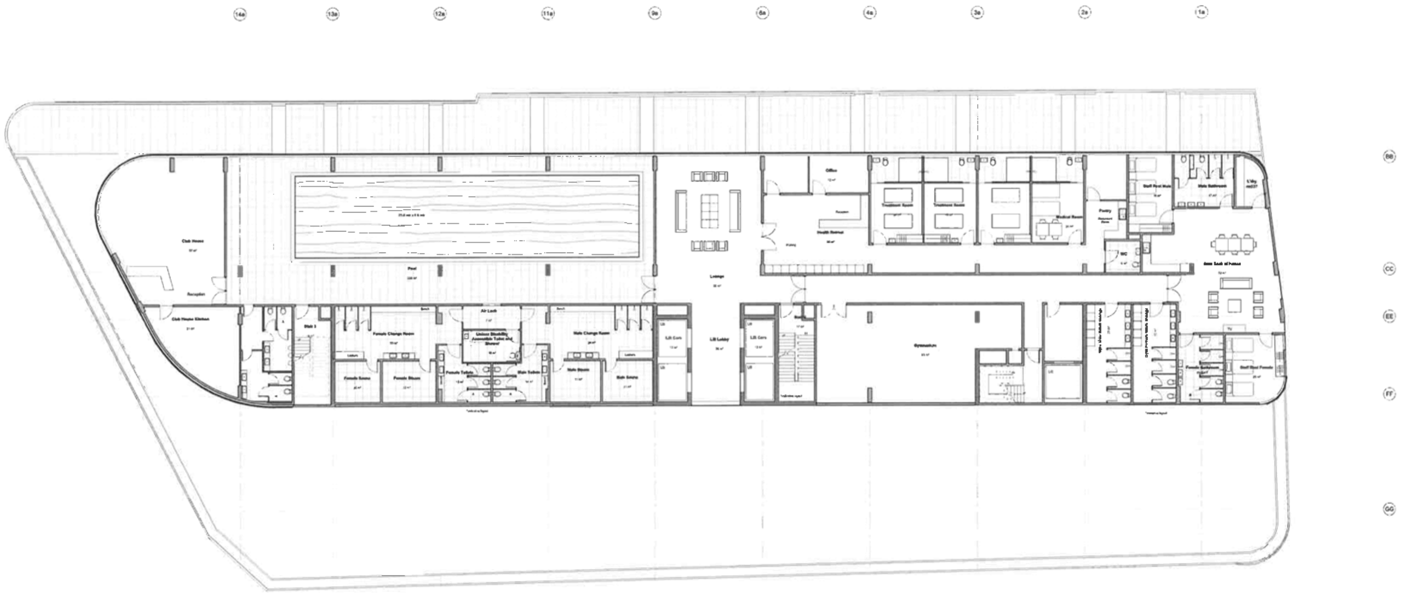
1A Storage and Administration...	
Name	Area
Corridors	64 m²
Administration	67 m²
Comms and Data	26 m²
Bulk Storage	358 m²
Lift Core	8 m²
Lift Core	13 m²
Lift Core	13 m²
Lift Core	12 m²
Stair 03	19 m²
Staff storage	47 m²

1 level 1A - storage & administration
1 : 100


Ramp down 1:5
2nd Floor Car Park Rooms
Name
Area
Stair 3
19 m²
Lift Lobby
25 m²
Lift Core
13 m²
Lift Core
13 m²
Stair 2
17 m²
Service
12 m²
Lift core
8 m²
Lift Core
12 m²
level 2 - carpark
1 : 100


level 3 - carpark
1 : 100


4th Floor Car Park Rooms
Name
Area
Stair 1
14 m²
Lift Core
6 m²
Service
11 m²
Stair 2
17 m²
Lift Lobby
25 m²
Lift Core
13 m²
Lift Core
13 m²
Stair 3
19 m²
full height mesh screen
void
Ramp Down 1:5
Turning point
1 level 4 - carpark
1 : 100



6th Pool and Wellbeing Rooms	
Name	Area
Stair 3	18 m²
Lift Core	13 m²
Lift Core	13 m²
Stair 2	17 m²
Gym Male toilet/ change	23 m²
Club House	87 m²
Club House Kitchen	31 m²
Pool	335 m²
Air Lock	7 m²
Male Toilets	14 m²
Male Change Room	29 m²
Lounge	99 m²
Lift Lobby	26 m²
Gymnasium	93 m²
Health Retreat	56 m²
Office	12 m²
Medical Room	34 m²
Treatment Room	49 m²
Treatment Room	24 m²
WC	6 m²
Staff Rest Male	18 m²
Staff Back of House	73 m²
Male Bathroom	17 m²
L'dry	7 m²
Female Bathroom	16 m²
Staff Rest Female	20 m²
Male Steam	11 m²
Male Sauna	11 m²
Female Change Room	33 m²
Female Steam	12 m²
Female Sauna	10 m²
Female Toilets	13 m²
Unisex Disability Accessible Toilet and Shower	10 m²
Gym Female toilet/ change	22 m²

1 level 6 - pool & wellbeing
1 : 100

S.

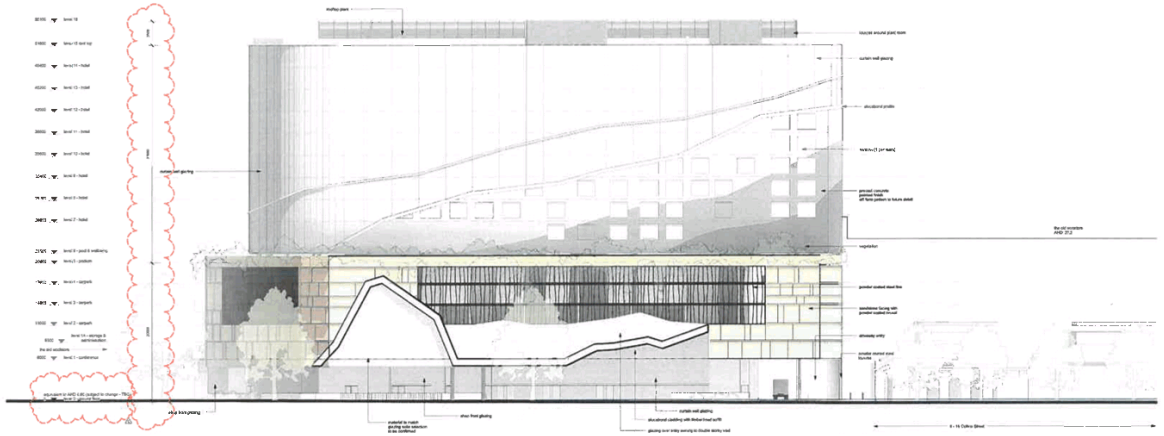
Pool & Wellbeing

A10

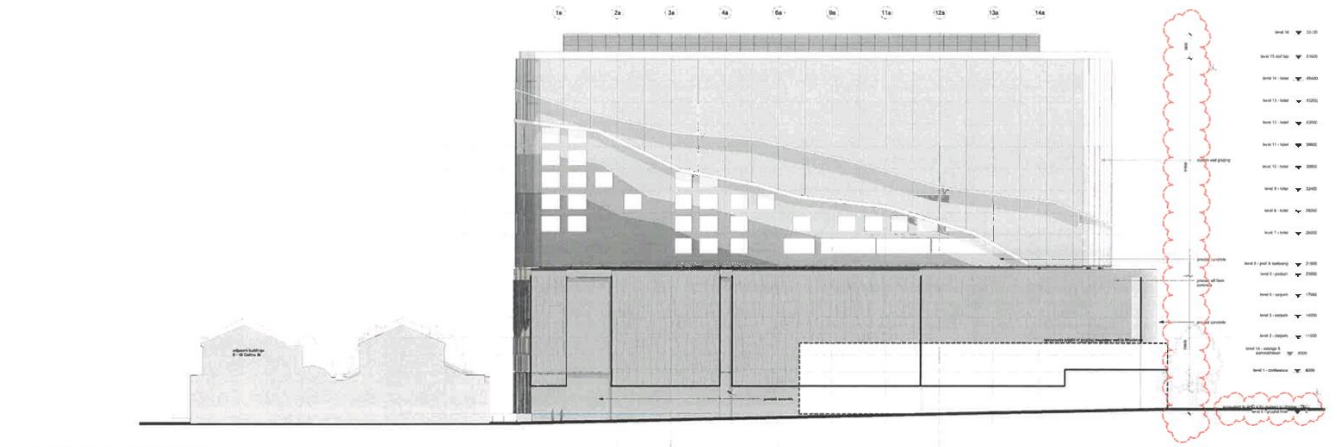
Hotel Suite Rooms	
Name	Area
Stair 3	15 m²
Lift Core	13 m²
Lift Core	13 m²
Stair 2	17 m²
Stair 1	14 m²
Service Lift	8 m²
General Storage	19 m²
Soil Linen Store	11 m²
Suite	26 m²
Suite	26 m²
Suite	25 m²
Suite	25 m²
Suite	26 m²
Story	6 m²
Suite	34 m²
Accessible Suite	39 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
3 Bedroom Suite	124 m²
2 Bedroom Suite	83 m²
Suite	26 m²
Suite	26 m²
Suite	26 m²
Suite	26 m²
Suite	26 m²
Lift Lobby	26 m²
Suite	26 m²
Service	11 m²

1 7th - 14th Floor - Hotel
1 : 100

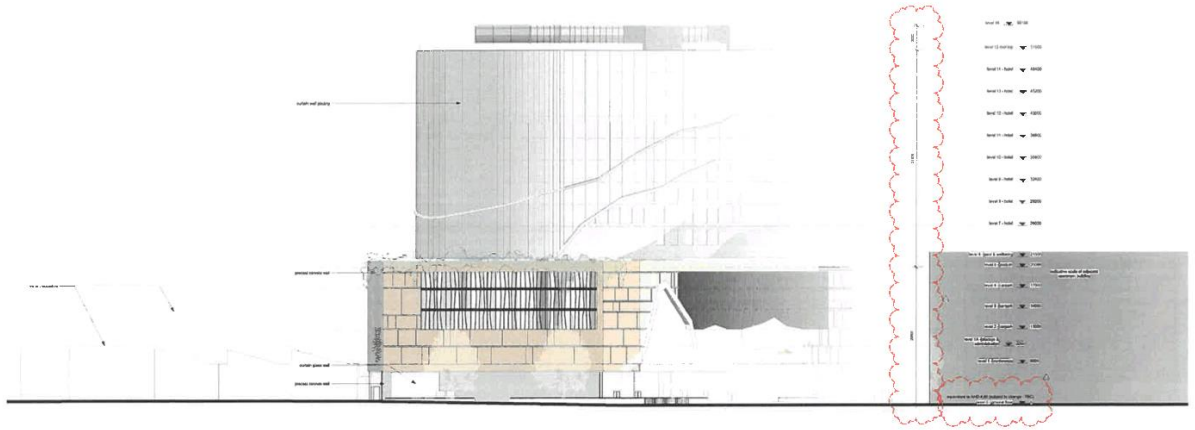
S.



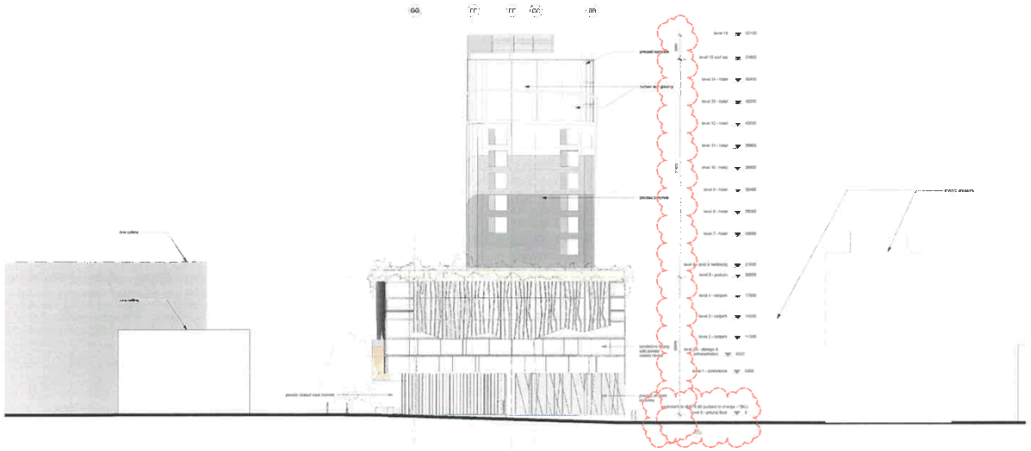
1 Collins Street Elevation
1 : 200



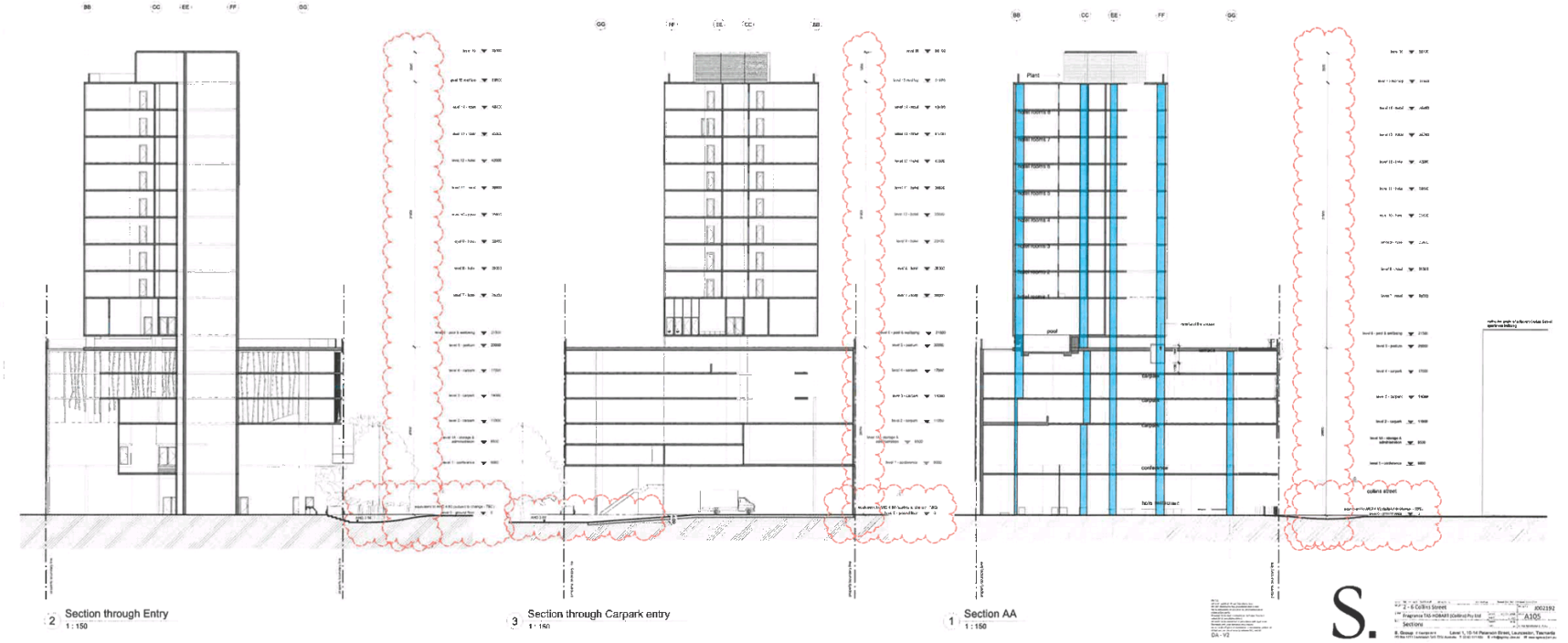
1 South East Elevation (Wool Store)
1 : 200



1 Brooker Street Elevation
1 : 200

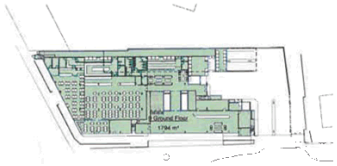


1 Ragged Lane Elevation
1 : 200

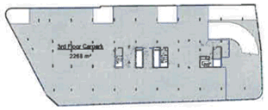

2 Section through Entry
1 : 150
3 Section through Carpark entry
1 : 150
1 Section AA
1 : 150
Plant
pool
collins street

1 Section (hydraulics)
1 : 200

2 Section through Entry (hydraulics)
1 : 200



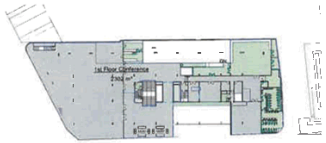
1 level 0 - ground floor
1 : 500



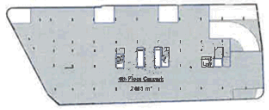
4 level 3 - carpark
1 : 500

8 level 6 - pool & wellbeing
1 : 500

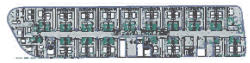
10 level 15 roof top
1 : 500



2 level 1 - conference
1 : 500

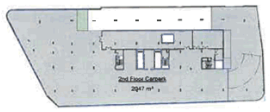


5 level 4 - carpark
1 : 500



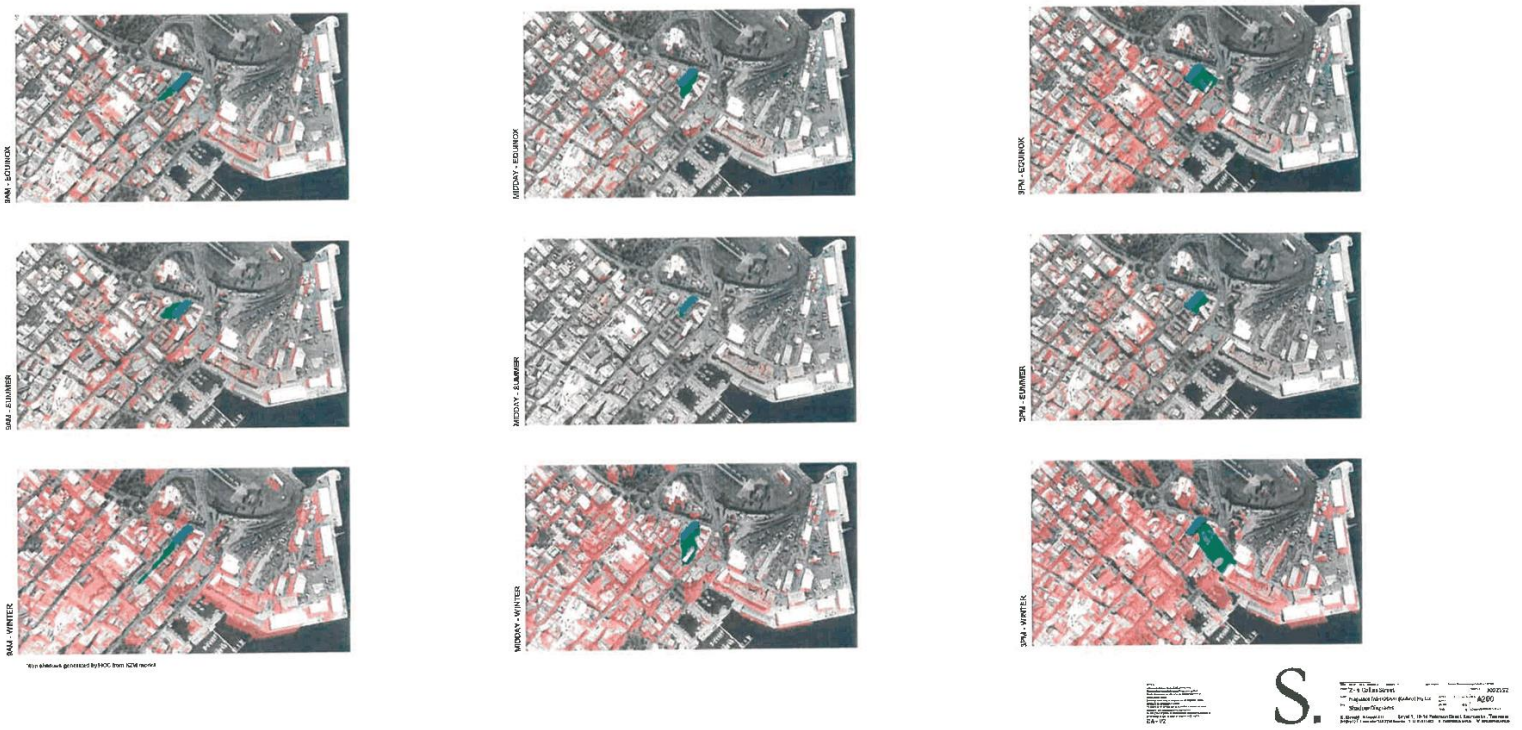
7 level 7 - 14 - hotel
1 : 500

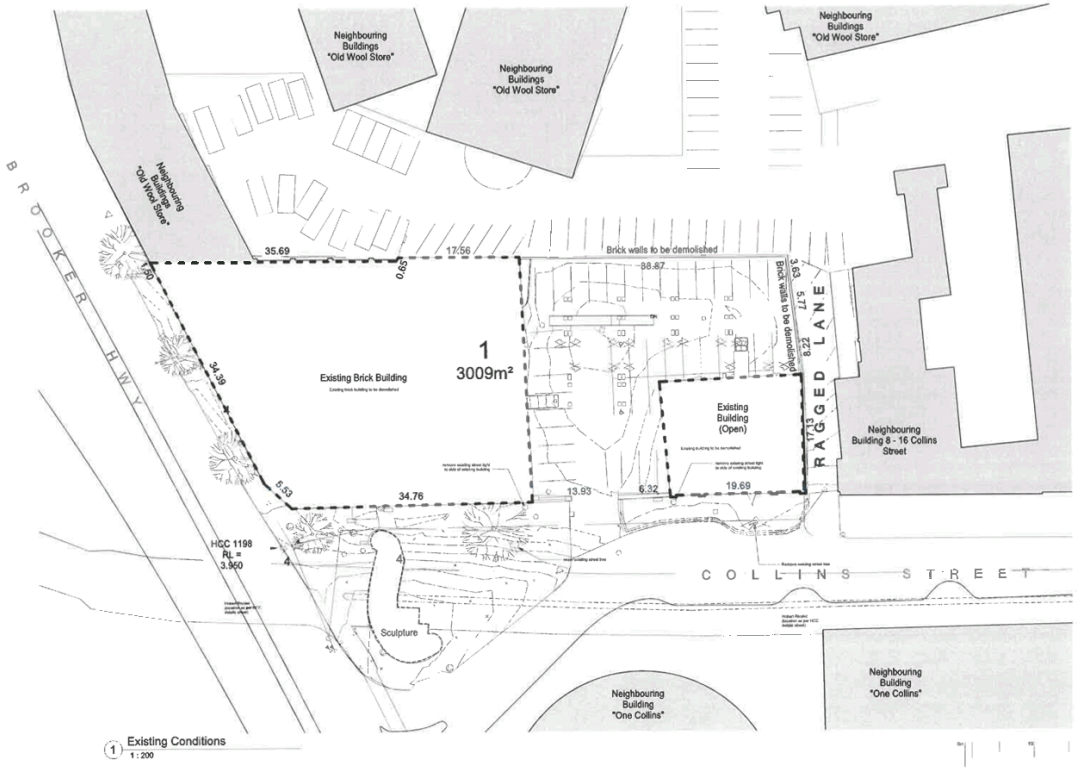
Area Schedule (Gross Building)	
Level	Area
level 0 - ground floor	1794 m²
level 1 - conference	2302 m²
level 2 - carpark	2047 m²
level 3 - carpark	2268 m²
level 4 - carpark	2485 m²
level 6 - pool & wellbeing	1438 m²
level 7 - hotel	1420 m²
level 8 - hotel	1420 m²
level 9 - hotel	1420 m²
level 10 - hotel	1420 m²
level 11 - hotel	1420 m²
level 12 - hotel	1420 m²
level 13 - hotel	1420 m²
level 14 - hotel	1420 m²
level 15 roof top	564 m²
Grand total: 15	24370 m²



3 level 2 - carpark
1 : 500

S.

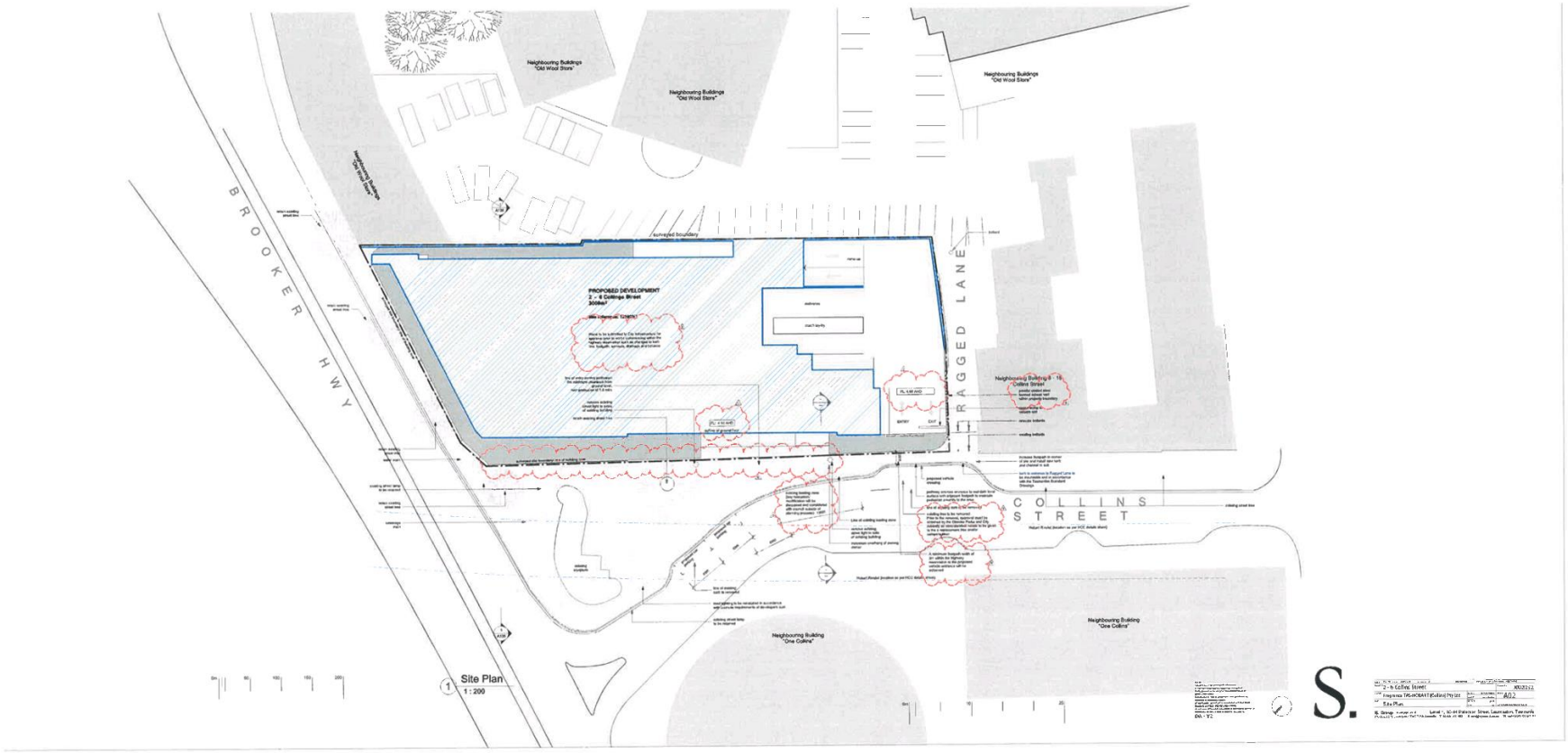

9AM - EQUINOX
MIDDAY - EQUINOX
3PM - EQUINOX
9AM - SUMMER
MIDDAY - SUMMER
3PM - SUMMER
9AM - WINTER
MIDDAY - WINTER
3PM - WINTER

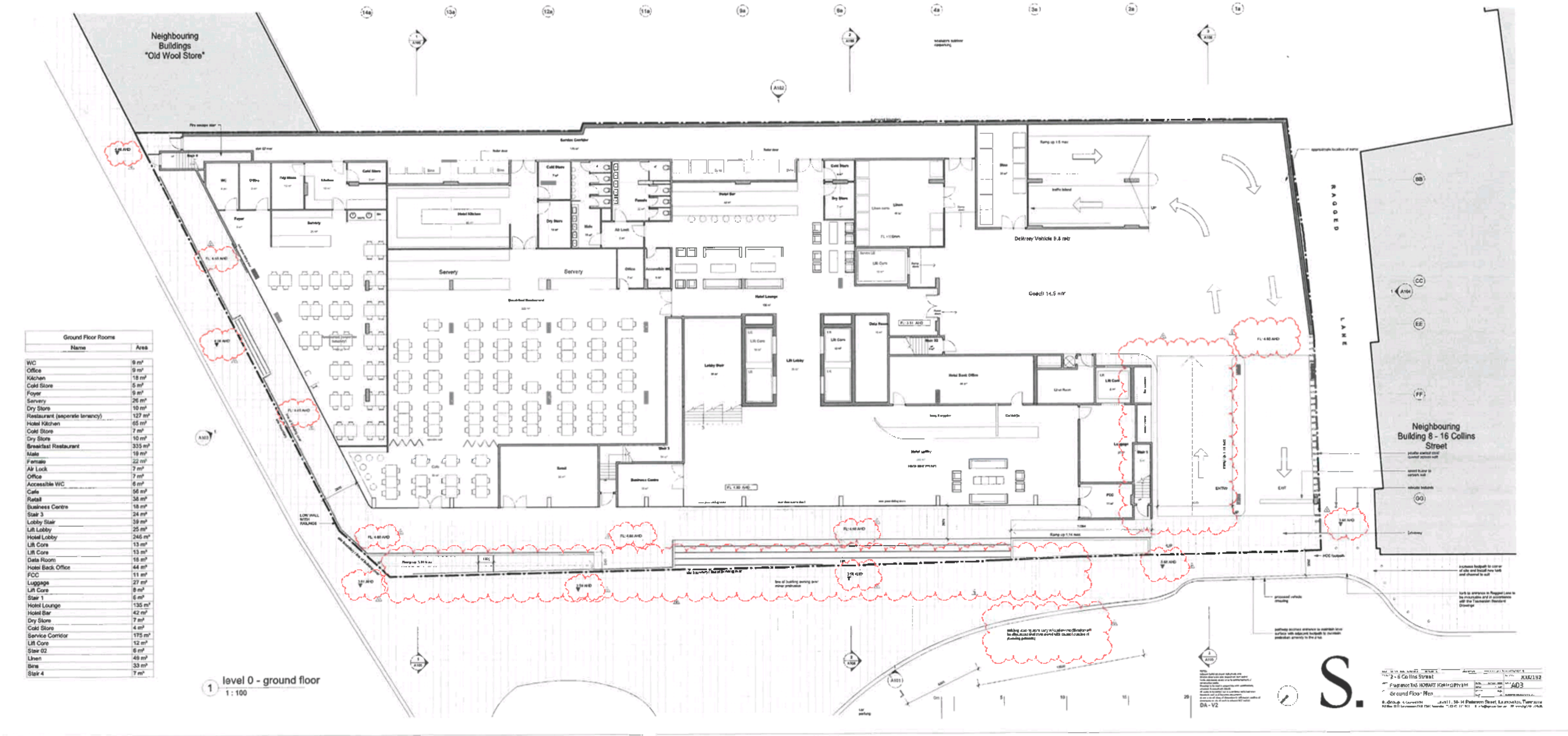


1 Existing Conditions
1 : 200

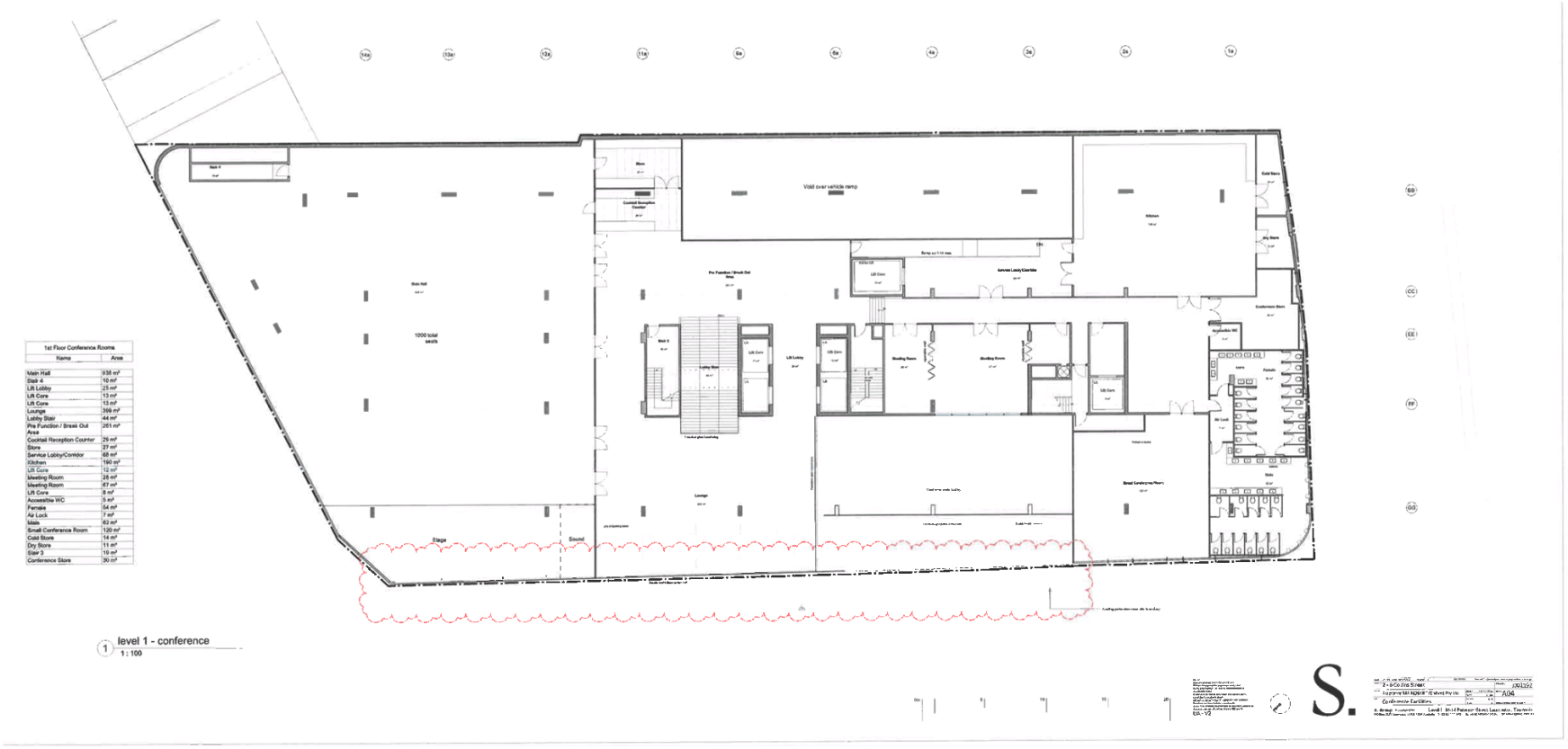
2 Location Plan
1 : 2000

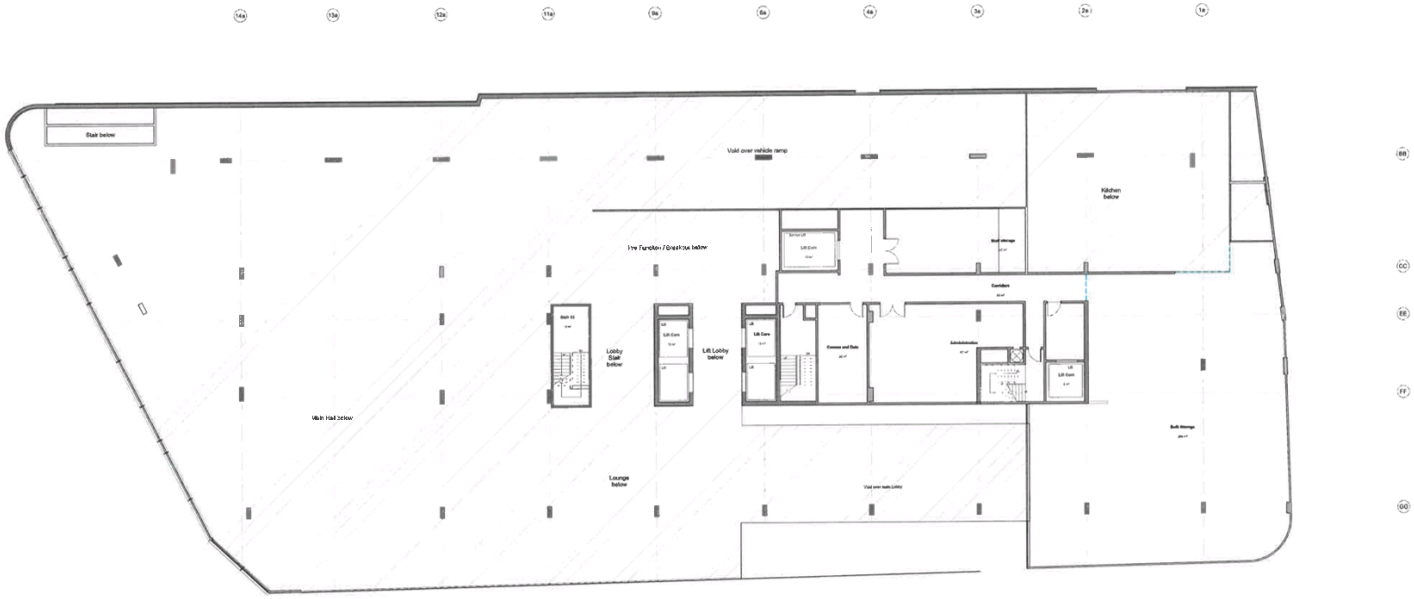
S.


Neighbouring Buildings
"Old Wool Store"
Neighbouring Buildings
"Old Wool Store"
Neighbouring Buildings
"Old Wool Store"
BROOKER HWY
RAGGED LANE
COLLINS STREET
PROPOSED DEVELOPMENT
2 - 8 Collins Street
300lm²
Neighbouring Building
"One Collins"
Neighbouring Building
"One Collins"
Site Plan
1 : 200



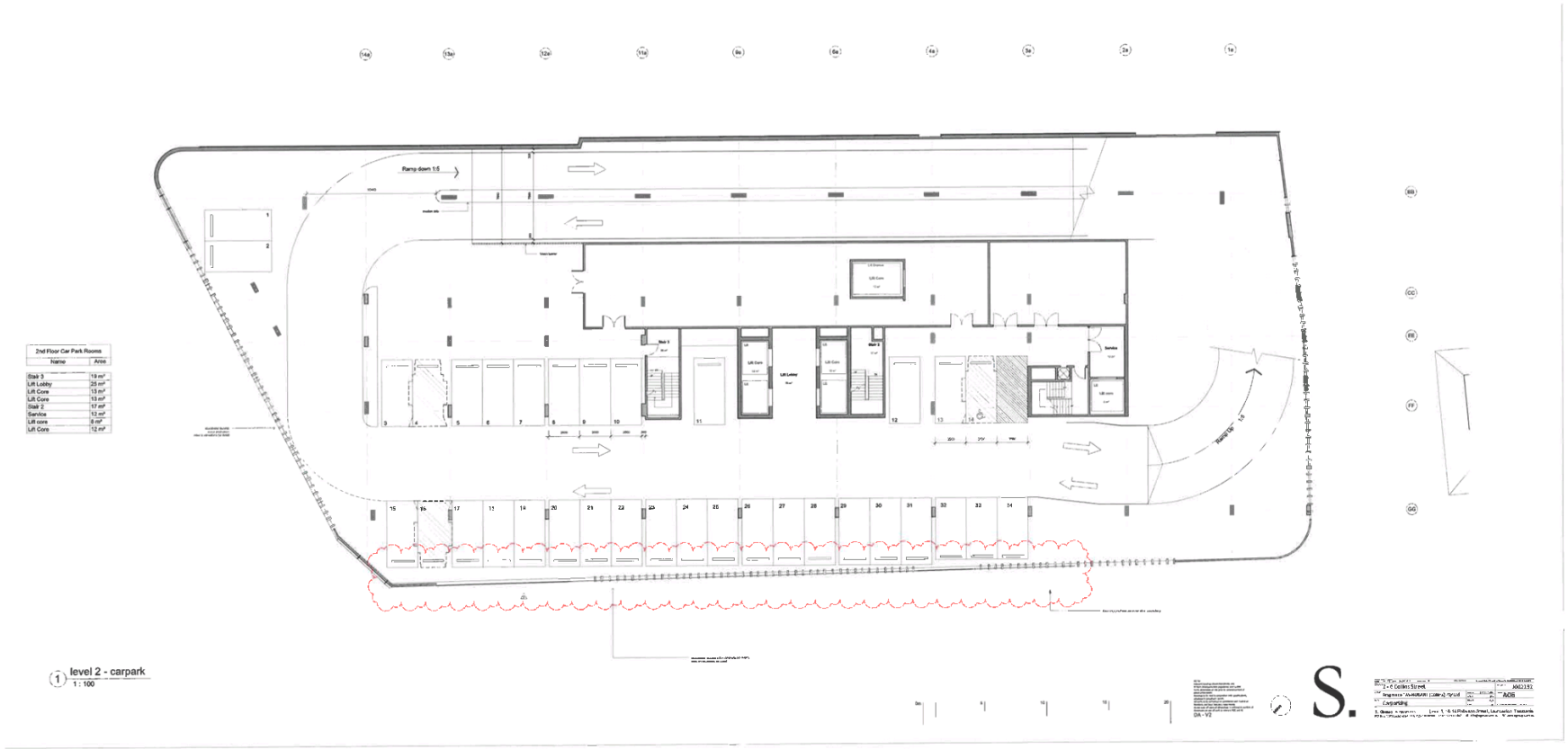
Ground Floor Rooms	
Name	Area
WC	9 m²
Office	9 m²
Kitchen	18 m²
Cold Store	5 m²
Foyer	9 m²
Servery	26 m²
Dry Store	10 m²
Restaurant (seperate tenancy)	127 m²
Hotel Kitchen	65 m²
Cold Store	7 m²
Dry Store	10 m²
Breakfast Restaurant	335 m²
Male	19 m²
Female	22 m²
Air Lock	7 m²
Office	7 m²
Accessible WC	6 m²
Cafe	56 m²
Retail	38 m²
Business Centre	18 m²
Stair 3	24 m²
Lobby Stair	39 m²
Lift Lobby	25 m²
Hotel Lobby	246 m²
Lift Core	13 m²
Lift Core	13 m²
Data Room	18 m²
Hotel Back Office	44 m²
FCC	11 m²
Luggage	27 m²
Lift Core	8 m²
Stair 1	6 m²
Hotel Lounge	135 m²
Hotel Bar	42 m²
Dry Store	7 m²
Cold Store	4 m²
Service Corridor	175 m²
Lift Core	12 m²
Stair 02	6 m²
Linen	49 m²
Bins	33 m²
Stair 4	7 m²

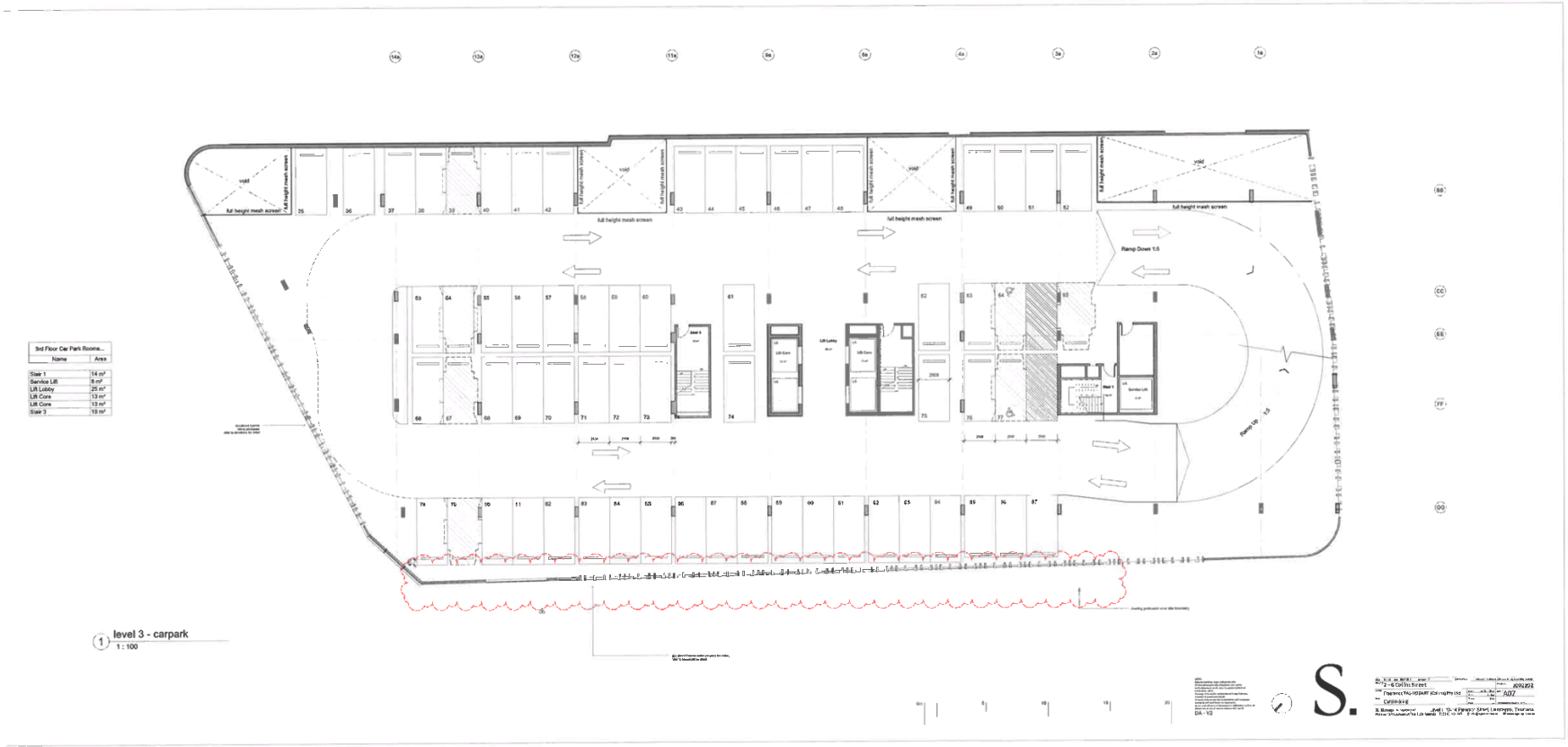

1st Floor Conference Rooms
Name | Area
Main Hall | 938 m²
Stair 4 | 10 m²
Lift Lobby | 25 m²
Lift Core | 13 m²
Lift Core | 13 m²
Lounge | 399 m²
Lobby Stair | 44 m²
Pre Function / Break Out Area | 261 m²
Cocktail Reception Counter | 29 m²
Store | 27 m²
Service Lobby/Corridor | 68 m²
Kitchen | 190 m²
Lift Core | 12 m²
Meeting Room | 28 m²
Meeting Room | 67 m²
Lift Core | 8 m²
Accessible WC | 5 m²
Female | 54 m²
Air Lock | 7 m²
Male | 62 m²
Small Conference Room | 120 m²
Cold Store | 14 m²
Dry Store | 11 m²
Stair 3 | 19 m²
Conference Store | 30 m²
Void over vehicle ramp
1000 total seats
Stage
Sound
Meeting Room
Meeting Room
Lounge
Bread Sandwiches Room
Kitchen
Cold Store
Dry Store
Conference Store
Female
Male
Air Lock
1 level 1 - conference
1 : 100

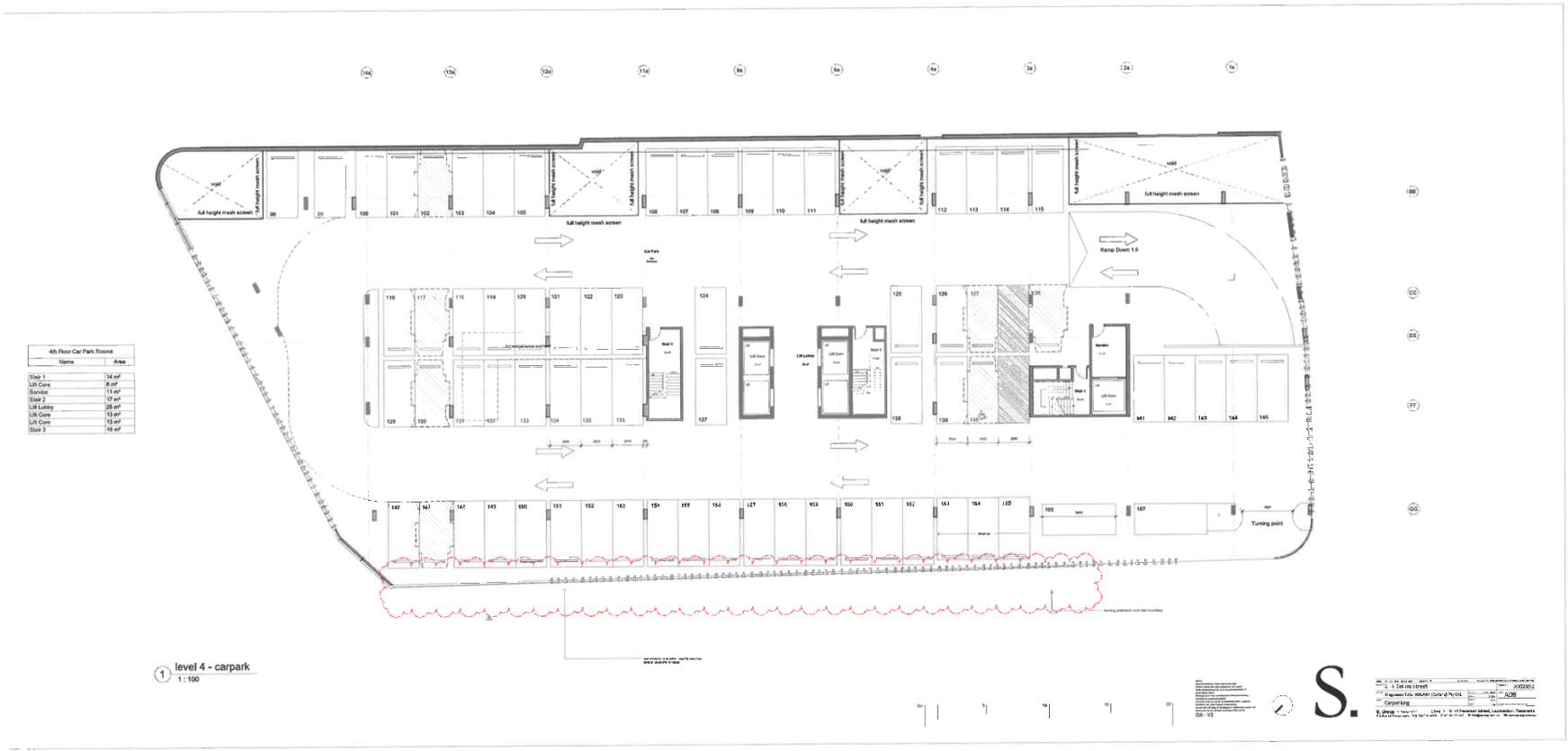


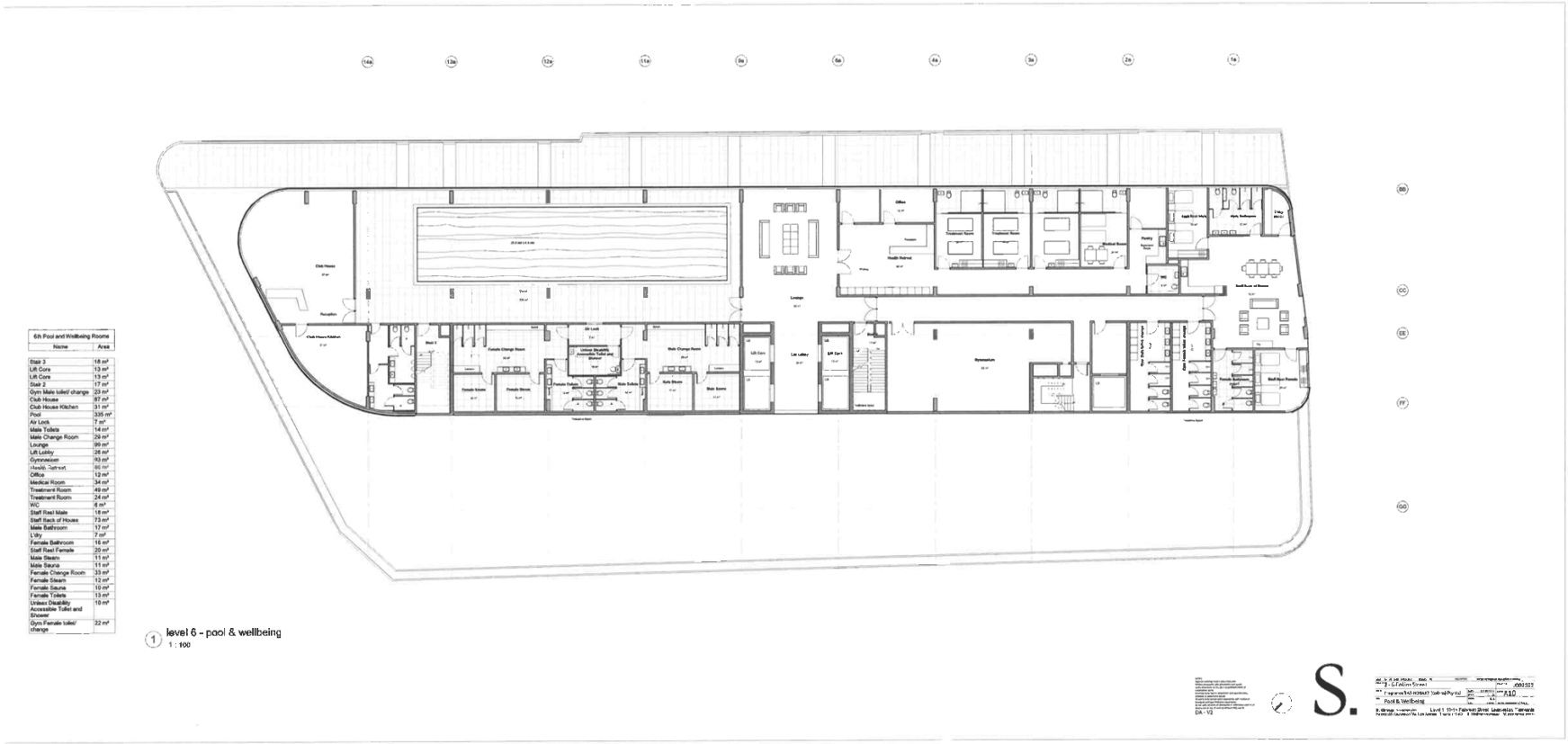
1A Storage and Administration...	
Name	Area
Corridors	64 m²
Administration	67 m²
Comms and Data	26 m²
Bulk Storage	356 m²
Lift Core	9 m²
Lift Core	13 m²
Lift Core	13 m²
Lift Core	12 m²
Stair 03	19 m²
Staff storage	47 m²

1 level 1A - storage & administration
1 : 100


2nd Floor Car Park Rooms
Name
Area
Ramp down 1:6
level 2 - carpark
1 : 100


3rd Floor Car Park Rooms...
Name
Area
Stair 1
14 m²
Service Lift
8 m²
Lift Lobby
25 m²
Lift Core
13 m²
Lift Core
13 m²
Stair 3
10 m²
full height mesh screen
void
Ramp Down 1:5
Ramp Up 1:5
level 3 - carpark
1 : 100


4th Floor Car Park Rooms
Name
Area
Stair 1
14 m²
Lift Core
8 m²
Service
11 m²
Stair 2
17 m²
Lift Lobby
25 m²
Lift Core
13 m²
Lift Core
13 m²
Stair 3
19 m²
full height mesh screen
void
Ramp Down 1:6
Turning point
1
level 4 - carpark
1 : 100



6th Pool and Wellbeing Rooms

Name	Area
Stair 3	18 m²
Lift Core	13 m²
Lift Core	13 m²
Stair 2	17 m²
Gym Male toilet/ change	23 m²
Club House	87 m²
Club House Kitchen	31 m²
Pool	335 m²
Air Lock	7 m²
Male Toilets	14 m²
Male Change Room	29 m²
Lounge	99 m²
Lift Lobby	26 m²
Gymnasium	93 m²
Health Retreat	60 m²
Office	12 m²
Medical Room	34 m²
Treatment Room	49 m²
Treatment Room	24 m²
WC	6 m²
Staff Rest Male	18 m²
Staff Rack of Houses	73 m²
Male Bathroom	17 m²
Lifty	7 m²
Female Bathroom	16 m²
Staff Rest Female	20 m²
Male Steam	11 m²
Male Sauna	11 m²
Female Change Room	33 m²
Female Steam	12 m²
Female Sauna	10 m²
Female Toilets	13 m²
Unisex Disability Accessible Toilet and Shower	10 m²
Gym Female toilet/ change	22 m²

1 level 6 - pool & wellbeing
1 : 100

DA - V2

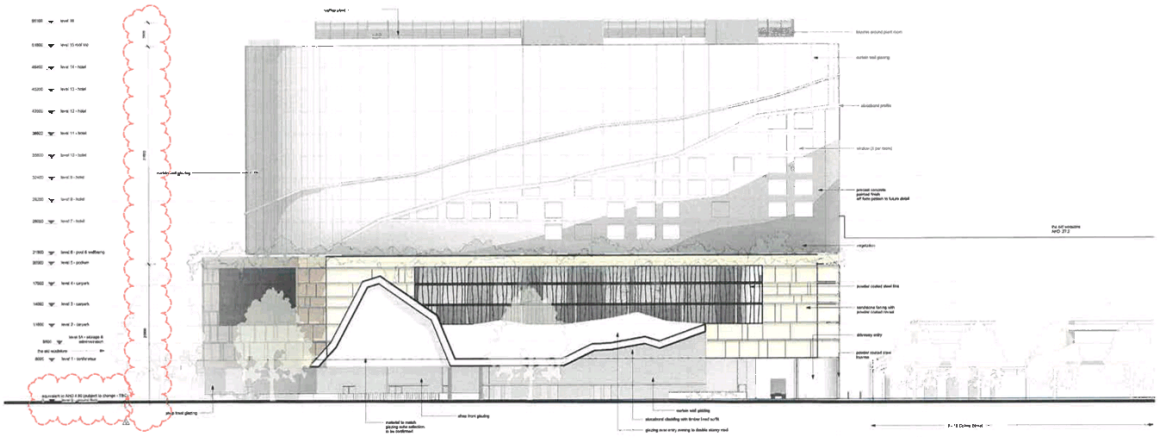
S.

Pool & Wellbeing

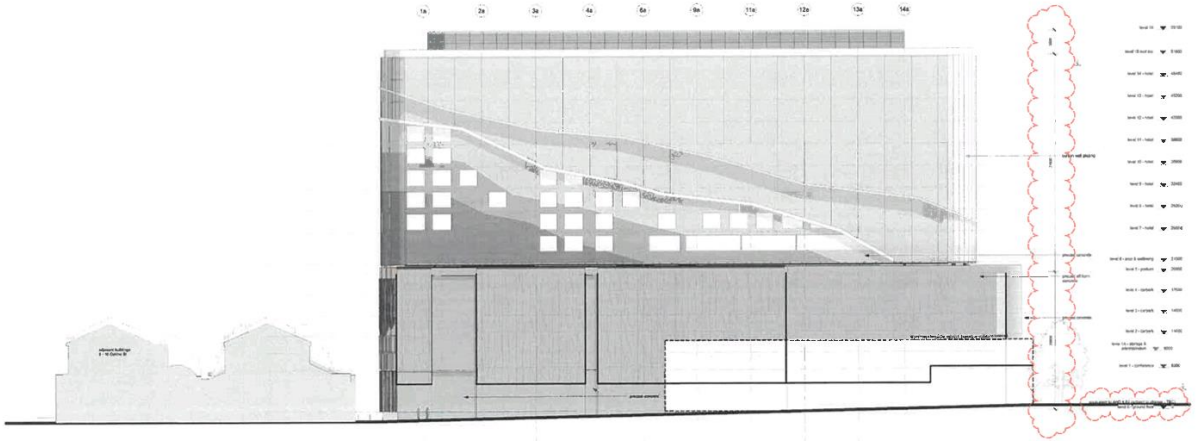
Hotel Suite Rooms

Name	Area
Stair 3	15 m²
Lift Core	13 m²
Lift Core	13 m²
Stair 2	17 m²
Stair 1	14 m²
Service Lift	8 m²
General Storage	19 m²
Soil Linen Store	11 m²
Suite	26 m²
Suite	25 m²
Suite	25 m²
Suite	25 m²
Suite	25 m²
Store	6 m²
Suite	24 m²
Accessible Suite	39 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
Suite	31 m²
3 Bedroom Suite	124 m²
2 Bedroom Suite	63 m²
Suite	25 m²
Suite	26 m²
Suite	25 m²
Suite	25 m²
Suite	25 m²
Lift Lobby	25 m²
Suite	26 m²
Service	11 m²

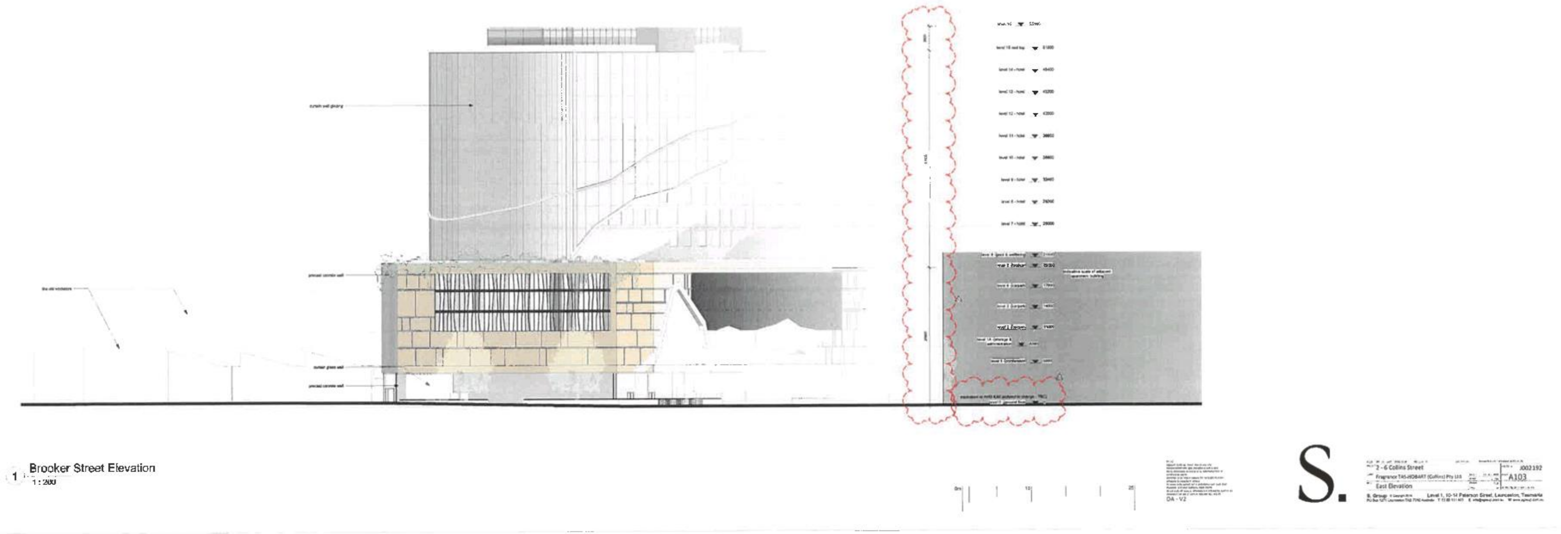
1 7th - 14th Floor - Hotel
1 : 100

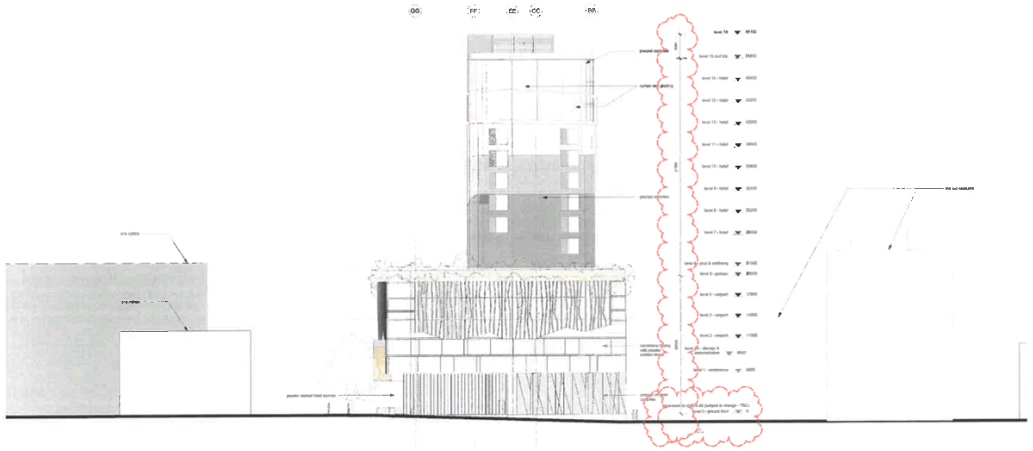


1 Collins Street Elevation
1 : 200

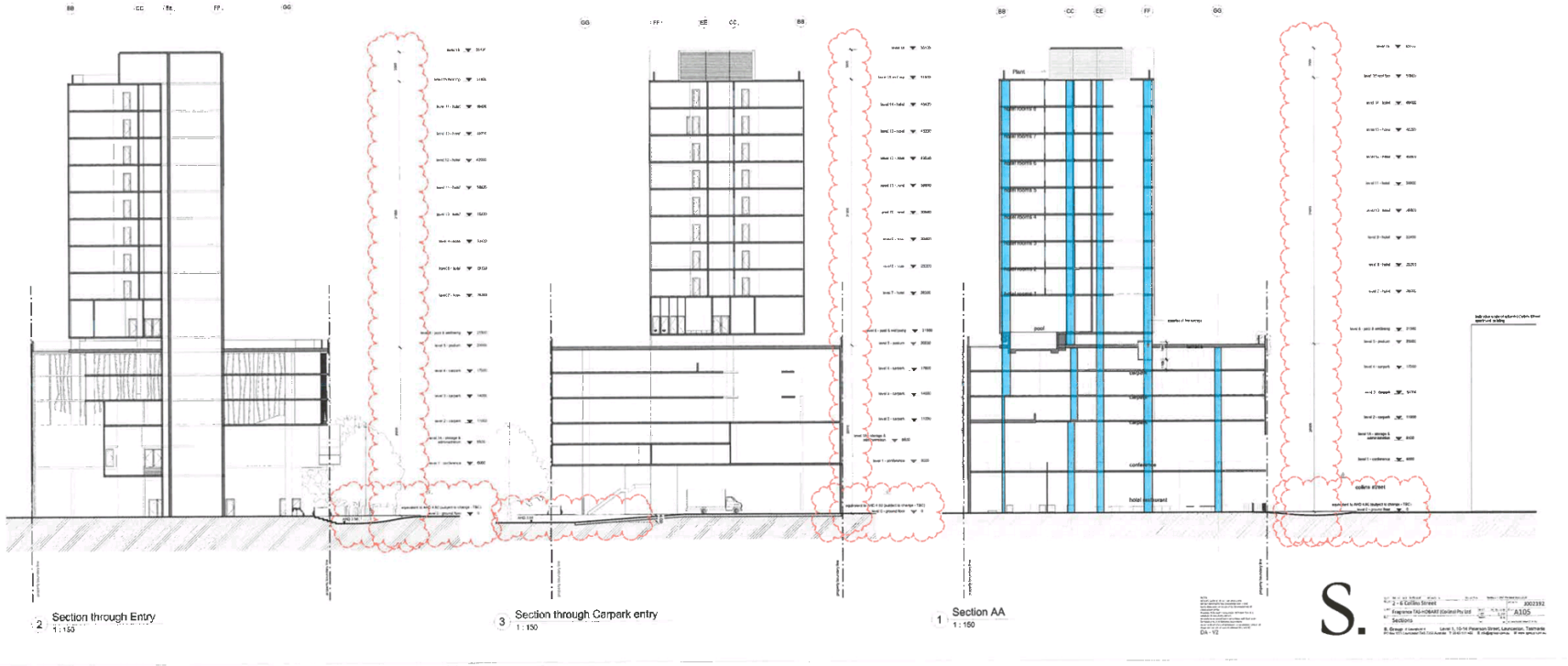


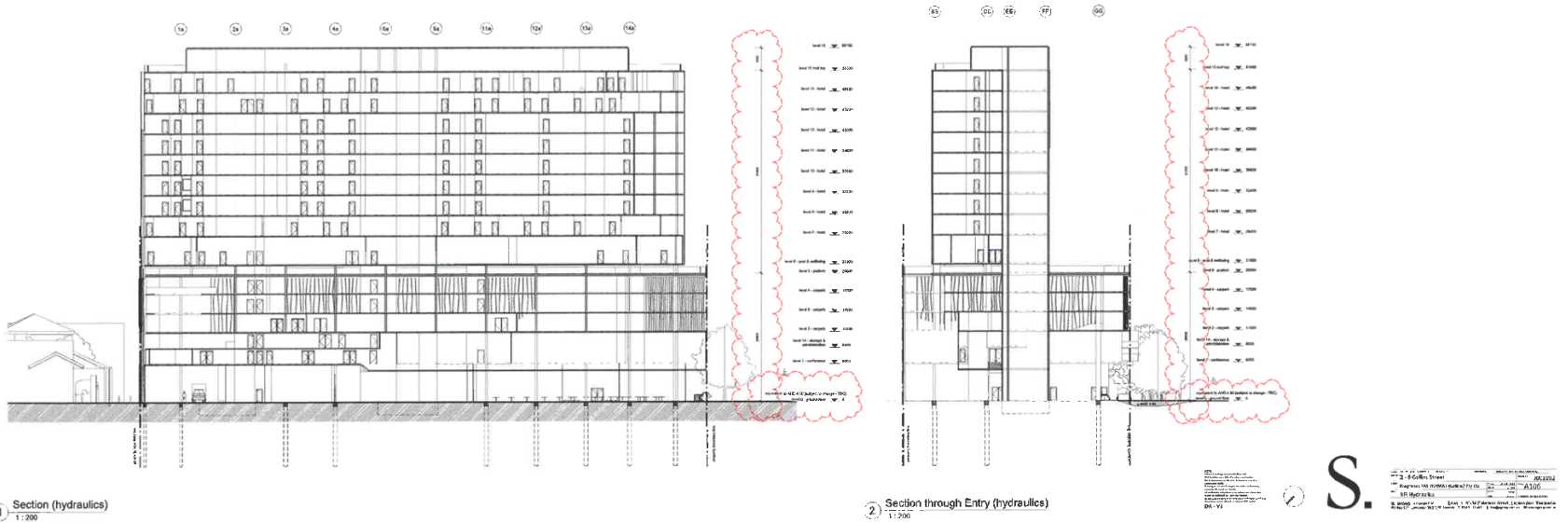
1 South East Elevation (Wool Store)
1 : 200


1 Brooker Street Elevation
1 : 200
S.
7 - 6 Collins Street
East Elevation
A103



1 Ragged Lane Elevation
1 : 200


2 Section through Entry
1 : 150
3 Section through Carpark entry
1 : 150
1 Section AA
1 : 150
Plant
pool
carpark
conference
hotel restaurant
collins street
S.



1 Section (hydraulics)
1 : 200

2 Section through Entry (hydraulics)
1 : 200

Appendix C
SIDRA Intersection Results
Post Development (2018) Operation

MOVEMENT SUMMARY

▽ Site: 102 [Collins Street/ Brooker Highway - Post Development (2018) AM Peak]

08:15-09:15
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Collins Street											
1	L2	124	5.0	0.117	7.5	LOS A	0.5	3.9	0.48	0.66	51.9
Approach		124	5.0	0.117	7.5	LOS A	0.5	3.9	0.48	0.66	51.9
East: Brooker Highway											
4	L2	52	5.0	0.267	5.6	LOS A	0.0	0.0	0.00	0.06	57.5
5	T1	955	5.0	0.267	0.0	LOS A	0.0	0.0	0.00	0.03	59.7
Approach		1006	5.0	0.267	0.3	NA	0.0	0.0	0.00	0.03	59.6
All Vehicles		1131	5.0	0.267	1.1	NA	0.5	3.9	0.05	0.10	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: PITT & SHERRY CONSULTING ENGINEERS | Processed: Monday, 15 January 2018 1:30:03 PM
Project: J:\LAU\2016\101-150\LN16146\14P - Calculations\SIDRA\Collins-Brooker - Smaller Building.sip7

MOVEMENT SUMMARY

▽ Site: 102 [Collins Street/ Brooker Highway - Post Development (2018) PM Peak]

16:30-17:30
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Collins Street											
1	L2	296	5.0	0.287	8.0	LOS A	1.4	10.6	0.55	0.72	51.6
Approach		296	5.0	0.287	8.0	LOS A	1.4	10.6	0.55	0.72	51.6
East: Brooker Highway											
4	L2	54	5.0	0.282	5.6	LOS A	0.0	0.0	0.00	0.06	57.5
5	T1	1009	5.0	0.282	0.0	LOS A	0.0	0.0	0.00	0.03	59.7
Approach		1063	5.0	0.282	0.3	NA	0.0	0.0	0.00	0.03	59.6
All Vehicles		1359	5.0	0.287	2.0	NA	1.4	10.6	0.12	0.18	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: PITT & SHERRY CONSULTING ENGINEERS | Processed: Monday, 15 January 2018 1:31:26 PM
Project: J:\LAU\2016\101-150\LN16146\14P - Calculations\SIDRA\Collins-Brooker - Smaller Building.sip7

MOVEMENT SUMMARY

Site: 101 [Collins Street/ Campbell Street - Post Development (2018) AM Peak]

08:15-09:15
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Collins Street											
24	L2	59	5.0	0.281	30.3	LOS C	2.3	16.7	0.91	0.74	40.0
25	T1	26	5.0	0.281	24.7	LOS C	2.3	16.7	0.91	0.74	40.8
Approach		85	5.0	0.281	28.6	LOS C	2.3	16.7	0.91	0.74	40.2
NorthWest: Campbell Street											
27	L2	75	5.0	0.323	11.1	LOS B	5.2	37.7	0.49	0.49	52.6
28	T1	694	5.0	0.323	5.5	LOS A	5.2	38.0	0.49	0.45	54.7
29	R2	532	10.0	0.484	11.9	LOS B	8.3	62.9	0.57	0.76	48.4
Approach		1300	7.0	0.484	8.4	LOS A	8.3	62.9	0.52	0.58	51.8
SouthWest: Collins Street											
31	T1	102	5.0	0.324	24.9	LOS C	2.8	20.2	0.92	0.72	42.6
32	R2	101	5.0	0.451	33.5	LOS C	2.9	21.4	0.96	0.78	37.5
Approach		203	5.0	0.451	29.2	LOS C	2.9	21.4	0.94	0.75	39.9
All Vehicles		1588	6.7	0.484	12.1	LOS B	8.3	62.9	0.60	0.61	49.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	SouthEast Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P6	NorthEast Full Crossing	53	6.1	LOS A	0.0	0.0	0.45	0.45
P7	NorthWest Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P8	SouthWest Full Crossing	53	7.0	LOS A	0.0	0.0	0.48	0.48
All Pedestrians		211	15.5	LOS B			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [Collins Street/ Campbell Street - Post Development (2018) PM Peak]

16:30-17:30
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Collins Street											
24	L2	81	5.0	0.183	20.4	LOS C	2.4	17.6	0.73	0.69	44.8
25	T1	36	5.0	0.183	14.8	LOS B	2.4	17.6	0.73	0.69	45.9
Approach		117	5.0	0.183	18.7	LOS B	2.4	17.6	0.73	0.69	45.2
NorthWest: Campbell Street											
27	L2	78	5.0	0.497	18.4	LOS B	8.8	64.3	0.76	0.68	47.6
28	T1	972	5.0	0.497	12.8	LOS B	8.9	64.9	0.76	0.68	49.0
29	R2	197	10.0	0.497	18.4	LOS B	8.5	63.6	0.76	0.73	46.2
Approach		1246	5.8	0.497	14.0	LOS B	8.9	64.9	0.76	0.69	48.4
SouthWest: Collins Street											
31	T1	217	5.0	0.328	15.7	LOS B	4.8	34.7	0.78	0.64	47.7
32	R2	223	5.0	0.510	24.5	LOS C	5.6	40.6	0.86	0.81	41.3
Approach		440	5.0	0.510	20.2	LOS C	5.6	40.6	0.82	0.73	44.2
All Vehicles		1803	5.5	0.510	15.8	LOS B	8.9	64.9	0.77	0.70	47.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	SouthEast Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P6	NorthEast Full Crossing	53	12.1	LOS B	0.1	0.1	0.63	0.63
P7	NorthWest Full Crossing	53	17.7	LOS B	0.1	0.1	0.77	0.77
P8	SouthWest Full Crossing	53	13.4	LOS B	0.1	0.1	0.67	0.67
All Pedestrians		211	15.2	LOS B			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

▽ Site: 101 [Collins Street/ Site Access - Post Development (2018) AM Peak]

08:15-09:15
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Site Access											
21	L2	44	5.0	0.069	5.7	LOS A	0.3	1.8	0.13	0.57	53.0
23	R2	37	5.0	0.069	6.4	LOS A	0.3	1.8	0.13	0.57	52.5
Approach		81	5.0	0.069	6.0	LOS A	0.3	1.8	0.13	0.57	52.8
NorthEast: Collins Street											
24	L2	33	5.0	0.039	5.6	LOS A	0.0	0.0	0.00	0.55	54.0
25	T1	40	5.0	0.039	4.2	LOS A	0.0	0.0	0.00	0.55	54.2
Approach		73	5.0	0.039	4.8	LOS A	0.0	0.0	0.00	0.55	54.1
SouthWest: Collins Street											
31	T1	111	5.0	0.129	4.2	LOS A	0.7	4.8	0.25	0.47	53.6
32	R2	66	5.0	0.129	7.5	LOS A	0.7	4.8	0.25	0.47	52.8
Approach		177	5.0	0.129	5.4	LOS A	0.7	4.8	0.25	0.47	53.3
All Vehicles		331	5.0	0.129	5.4	NA	0.7	4.8	0.16	0.51	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Collins Street/ Site Access - Post Development (2018) PM Peak]

08:15-09:15
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Site Access											
21	L2	44	5.0	0.077	5.8	LOS A	0.3	2.1	0.19	0.58	52.7
23	R2	37	5.0	0.077	7.4	LOS A	0.3	2.1	0.19	0.58	52.2
Approach		81	5.0	0.077	6.5	LOS A	0.3	2.1	0.19	0.58	52.4
NorthEast: Collins Street											
24	L2	36	5.0	0.058	5.6	LOS A	0.0	0.0	0.00	0.55	54.1
25	T1	73	5.0	0.058	4.2	LOS A	0.0	0.0	0.00	0.55	54.3
Approach		108	5.0	0.058	4.7	LOS A	0.0	0.0	0.00	0.55	54.3
SouthWest: Collins Street											
31	T1	222	5.0	0.197	4.2	LOS A	1.2	8.8	0.31	0.43	53.6
32	R2	72	5.0	0.197	9.8	LOS A	1.2	8.8	0.31	0.43	52.8
Approach		294	5.0	0.197	5.6	LOS A	1.2	8.8	0.31	0.43	53.4
All Vehicles		483	5.0	0.197	5.5	NA	1.2	8.8	0.22	0.48	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix D
SIDRA Intersection Results
Post Development (2028) Operation

MOVEMENT SUMMARY

▽ Site: 102 [Collins Street/ Brooker Highway - Post Development (2028) AM Peak]

08:15-09:15
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Collins Street											
1	L2	143	5.0	0.152	8.2	LOS A	0.7	5.0	0.54	0.72	51.4
Approach		143	5.0	0.152	8.2	LOS A	0.7	5.0	0.54	0.72	51.4
East: Brooker Highway											
4	L2	56	5.0	0.324	5.6	LOS A	0.0	0.0	0.00	0.05	57.6
5	T1	1164	5.0	0.324	0.0	LOS A	0.0	0.0	0.00	0.03	59.7
Approach		1220	5.0	0.324	0.3	NA	0.0	0.0	0.00	0.03	59.6
All Vehicles		1363	5.0	0.324	1.1	NA	0.7	5.0	0.06	0.10	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 102 [Collins Street/ Brooker Highway - Post Development (2028) PM Peak]

16:30-17:30
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Collins Street											
1	L2	353	5.0	0.388	9.7	LOS A	2.5	18.0	0.63	0.87	50.4
Approach		353	5.0	0.388	9.7	LOS A	2.5	18.0	0.63	0.87	50.4
East: Brooker Highway											
4	L2	57	5.0	0.342	5.6	LOS A	0.0	0.0	0.00	0.05	57.6
5	T1	1231	5.0	0.342	0.0	LOS A	0.0	0.0	0.00	0.03	59.7
Approach		1287	5.0	0.342	0.3	NA	0.0	0.0	0.00	0.03	59.6
All Vehicles		1640	5.0	0.388	2.3	NA	2.5	18.0	0.14	0.21	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Collins Street/ Campbell Street - Post Development (2028) AM Peak]

08:15-09:15
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Collins Street											
24	L2	63	5.0	0.308	30.5	LOS C	2.5	18.5	0.92	0.75	39.9
25	T1	31	5.0	0.308	24.9	LOS C	2.5	18.5	0.92	0.75	40.8
Approach		94	5.0	0.308	28.6	LOS C	2.5	18.5	0.92	0.75	40.2
NorthWest: Campbell Street											
27	L2	84	5.0	0.390	11.4	LOS B	6.6	48.2	0.52	0.51	52.4
28	T1	845	5.0	0.390	5.8	LOS A	6.7	48.7	0.52	0.48	54.4
29	R2	647	10.0	0.590	12.6	LOS B	11.2	84.9	0.63	0.79	47.9
Approach		1577	7.1	0.590	8.9	LOS A	11.2	84.9	0.57	0.61	51.5
SouthWest: Collins Street											
31	T1	117	5.0	0.371	25.1	LOS C	3.2	23.3	0.93	0.73	42.4
32	R2	123	5.0	0.565	34.2	LOS C	3.7	26.8	0.98	0.80	37.2
Approach		240	5.0	0.565	29.8	LOS C	3.7	26.8	0.96	0.77	39.6
All Vehicles		1911	6.7	0.590	12.5	LOS B	11.2	84.9	0.63	0.64	48.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	SouthEast Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P6	NorthEast Full Crossing	53	6.1	LOS A	0.0	0.0	0.45	0.45
P7	NorthWest Full Crossing	53	24.4	LOS C	0.1	0.1	0.90	0.90
P8	SouthWest Full Crossing	53	7.0	LOS A	0.0	0.0	0.48	0.48
All Pedestrians		211	15.5	LOS B			0.68	0.68

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [Collins Street/ Campbell Street - Post Development (2028) PM Peak]

16:30-17:30
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Collins Street											
24	L2	92	5.0	0.199	19.8	LOS B	2.7	19.6	0.72	0.69	45.2
25	T1	41	5.0	0.199	14.2	LOS B	2.7	19.6	0.72	0.69	46.3
Approach		133	5.0	0.199	18.0	LOS B	2.7	19.6	0.72	0.69	45.5
NorthWest: Campbell Street											
27	L2	86	5.0	0.626	20.1	LOS C	11.8	85.8	0.83	0.75	46.7
28	T1	1184	5.0	0.626	14.5	LOS B	11.9	86.6	0.83	0.75	47.9
29	R2	240	10.0	0.626	20.1	LOS C	11.4	84.8	0.83	0.78	45.2
Approach		1511	5.8	0.626	15.7	LOS B	11.9	86.6	0.83	0.75	47.4
SouthWest: Collins Street											
31	T1	256	5.0	0.369	15.3	LOS B	5.6	40.8	0.78	0.65	48.0
32	R2	273	5.0	0.611	24.7	LOS C	7.0	51.3	0.89	0.83	41.2
Approach		528	5.0	0.611	20.1	LOS C	7.0	51.3	0.83	0.74	44.3
All Vehicles		2172	5.6	0.626	16.9	LOS B	11.9	86.6	0.83	0.75	46.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P5	SouthEast Full Crossing	53	16.9	LOS B	0.1	0.1	0.75	0.75
P6	NorthEast Full Crossing	53	12.7	LOS B	0.1	0.1	0.65	0.65
P7	NorthWest Full Crossing	53	16.9	LOS B	0.1	0.1	0.75	0.75
P8	SouthWest Full Crossing	53	14.0	LOS B	0.1	0.1	0.68	0.68
All Pedestrians		211	15.1	LOS B			0.71	0.71

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

▽ Site: 101 [Collins Street/ Site Access - Post Development (2028) AM Peak]

08:15-09:15
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Site Access											
21	L2	44	5.0	0.070	5.8	LOS A	0.3	1.9	0.14	0.57	53.0
23	R2	37	5.0	0.070	6.6	LOS A	0.3	1.9	0.14	0.57	52.4
Approach		81	5.0	0.070	6.1	LOS A	0.3	1.9	0.14	0.57	52.7
NorthEast: Collins Street											
24	L2	33	5.0	0.044	5.6	LOS A	0.0	0.0	0.00	0.55	54.1
25	T1	49	5.0	0.044	4.2	LOS A	0.0	0.0	0.00	0.55	54.3
Approach		82	5.0	0.044	4.8	LOS A	0.0	0.0	0.00	0.55	54.2
SouthWest: Collins Street											
31	T1	135	5.0	0.143	4.2	LOS A	0.8	5.6	0.26	0.46	53.6
32	R2	66	5.0	0.143	8.0	LOS A	0.8	5.6	0.26	0.46	52.9
Approach		201	5.0	0.143	5.4	LOS A	0.8	5.6	0.26	0.46	53.3
All Vehicles		364	5.0	0.143	5.4	NA	0.8	5.6	0.18	0.50	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▽ Site: 101 [Collins Street/ Site Access - Post Development (2028) PM Peak]

08:15-09:15
Giveway / Yield (Two-Way)

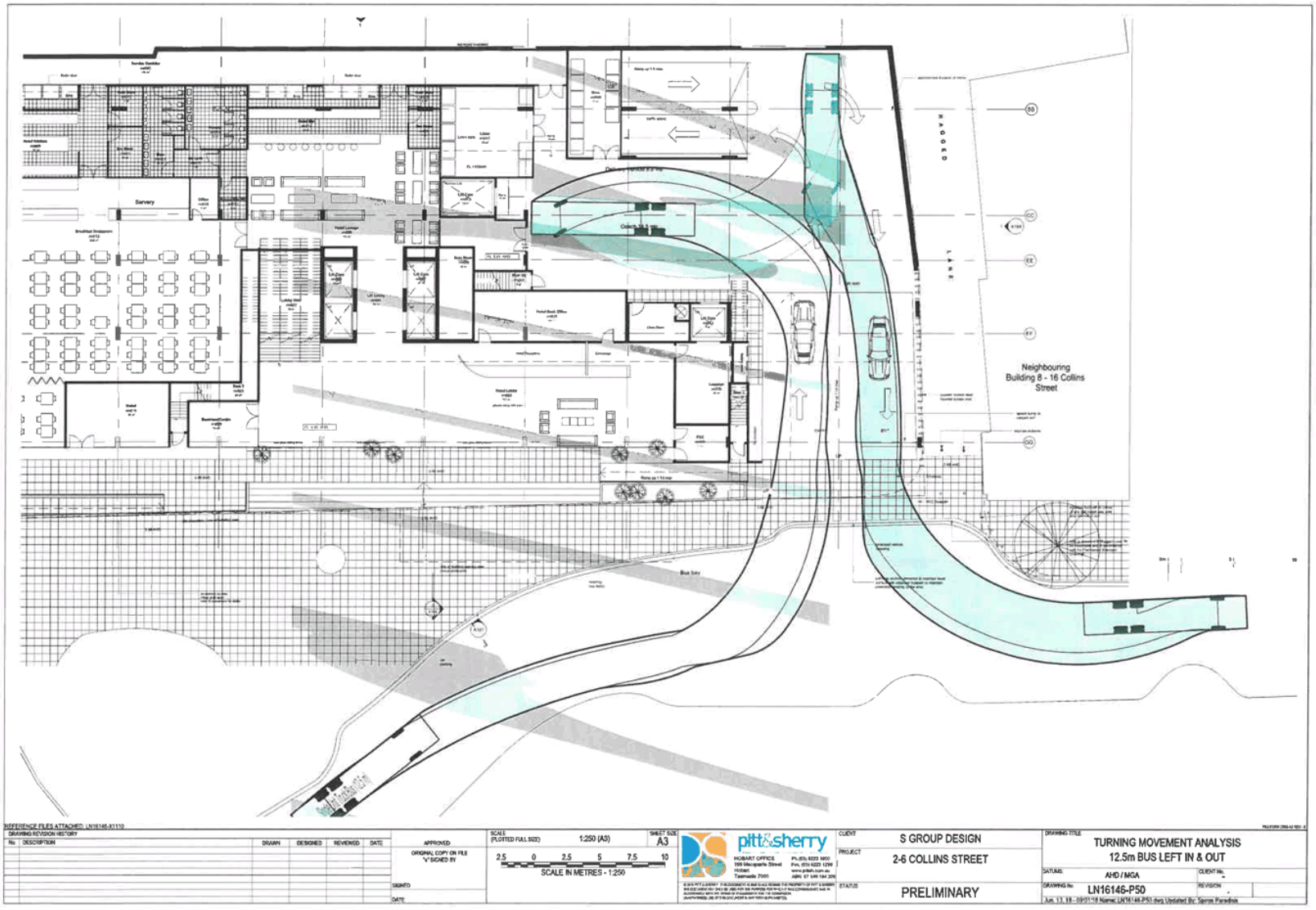
Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
SouthEast: Site Access											
21	L2	44	5.0	0.081	5.9	LOS A	0.3	2.2	0.22	0.59	52.5
23	R2	37	5.0	0.081	7.9	LOS A	0.3	2.2	0.22	0.59	52.0
Approach		81	5.0	0.081	6.8	LOS A	0.3	2.2	0.22	0.59	52.2
NorthEast: Collins Street											
24	L2	36	5.0	0.067	5.6	LOS A	0.0	0.0	0.00	0.54	54.2
25	T1	88	5.0	0.067	4.2	LOS A	0.0	0.0	0.00	0.54	54.4
Approach		124	5.0	0.067	4.6	LOS A	0.0	0.0	0.00	0.54	54.3
SouthWest: Collins Street											
31	T1	271	5.0	0.224	4.2	LOS A	1.5	10.8	0.33	0.41	53.5
32	R2	72	5.0	0.224	11.3	LOS B	1.5	10.8	0.33	0.41	52.8
Approach		342	5.0	0.224	5.7	LOS A	1.5	10.8	0.33	0.41	53.4
All Vehicles		547	5.0	0.224	5.6	NA	1.5	10.8	0.24	0.47	53.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E

Swept Paths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LANE
Servery
Bus bay
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SIGNED
DATE
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SCALE IN METRES - 1:250
pitt&sherry
HOBART OFFICE
199 Macquarie Street
Hobart
Tasmania 7000
Ph (03) 6223 1400
Fax (03) 6223 1299
www.pitt-sh.com.au
ABN 67 140 184 309
CLIENT S GROUP DESIGN
PROJECT 2-6 COLLINS STREET
STATUS PRELIMINARY
DRAWING TITLE
TURNING MOVEMENT ANALYSIS
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DATUM: AHD / MGA
CLIENT No.
DRAWING No LN16146-P50
REVISION -
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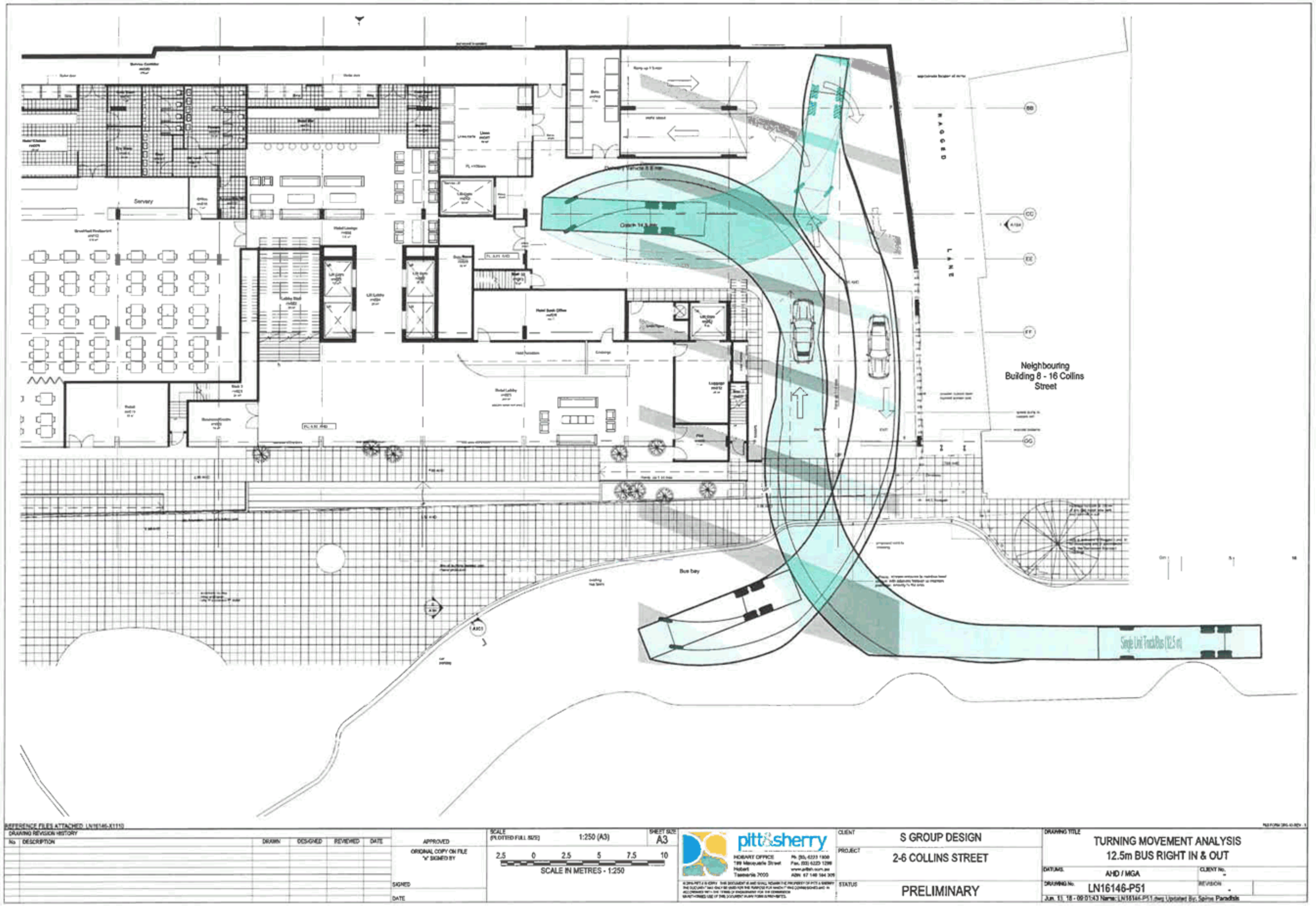
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Bus bay
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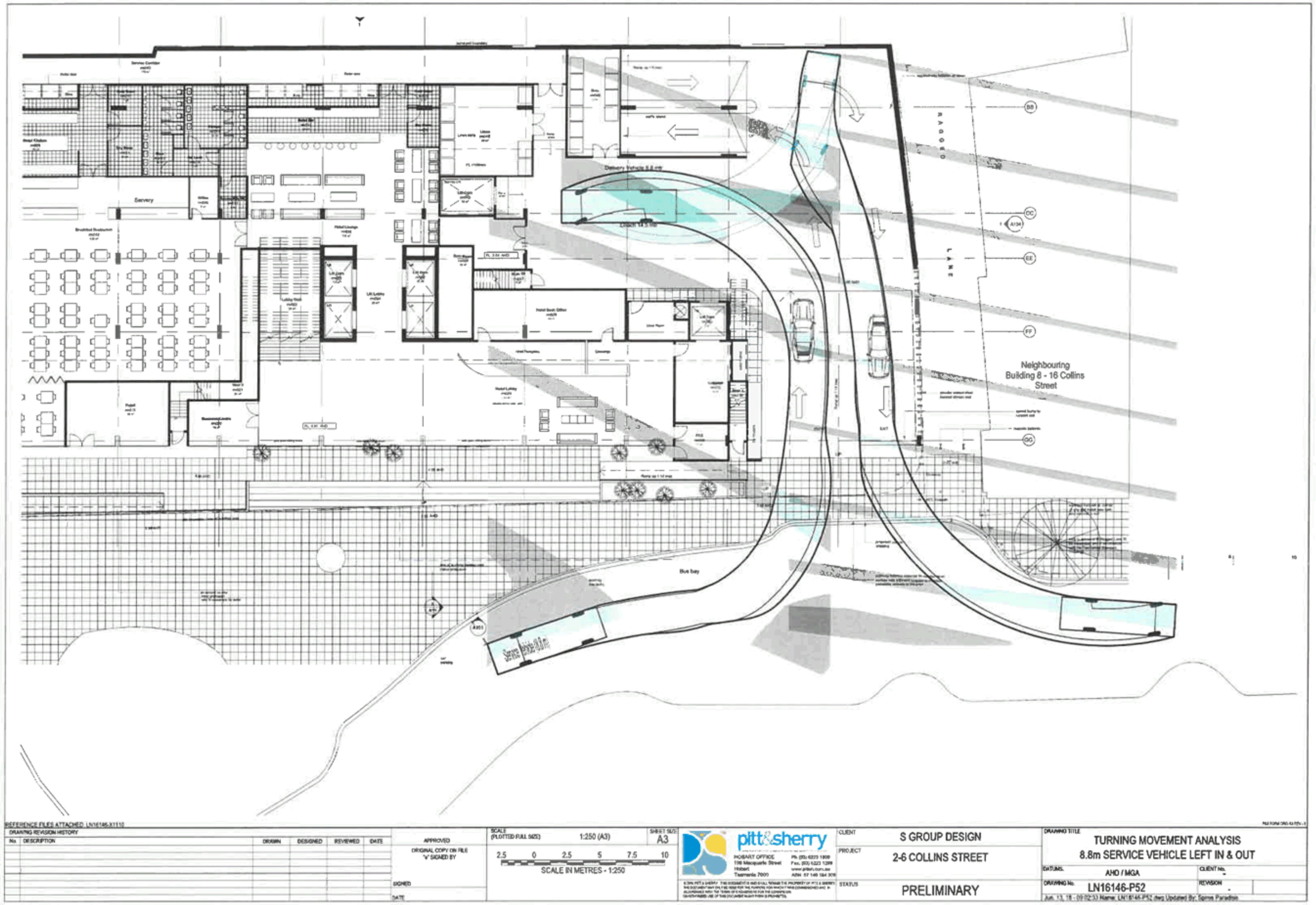
HOBART OFFICE
199 Macquarie Street
Hobart
Tasmania 7000
CLIENT S GROUP DESIGN
PROJECT 2-6 COLLINS STREET
STATUS PRELIMINARY
DRAWING TITLE TURNING MOVEMENT ANALYSIS
12.5m BUS RIGHT IN & OUT
DATUMS AHD / MGA
CLIENT No. -
DRAWING No. LN16146-P51
REVISION -


Neighbouring
Building 8 - 16 Collins
Street
Bus bay
Service Vehicle (8.8 m)
pitt&sherry
S GROUP DESIGN
2-6 COLLINS STREET
PRELIMINARY
TURNING MOVEMENT ANALYSIS
8.8m SERVICE VEHICLE LEFT IN & OUT
AHD / MGA
LN16146-P52
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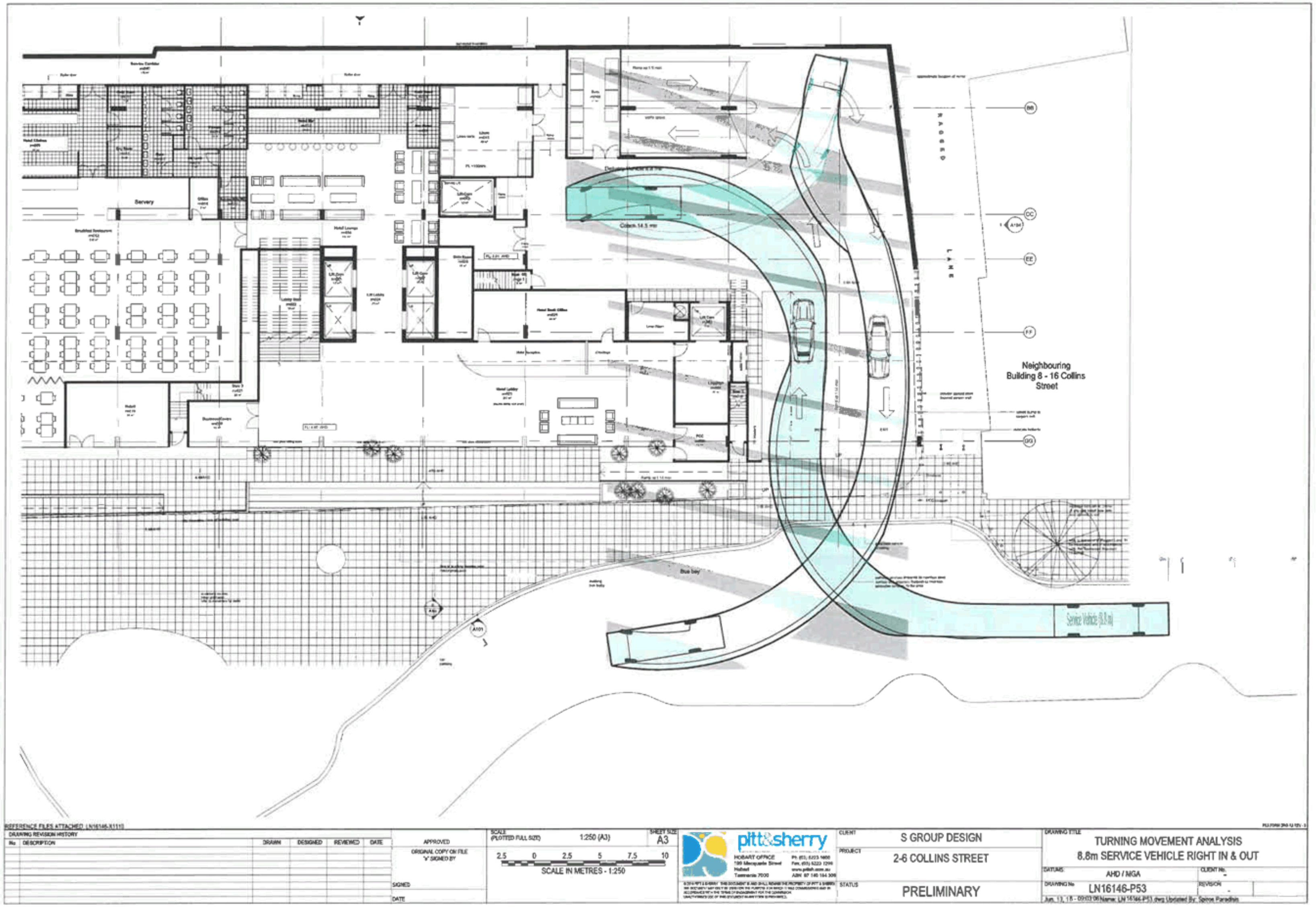
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Bus bay
Service Vehicle (8.8m)
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pitt&sherry
HOBART OFFICE
CLIENT
S GROUP DESIGN
PROJECT
2-6 COLLINS STREET
STATUS
PRELIMINARY
DRAWING TITLE
TURNING MOVEMENT ANALYSIS
8.8m SERVICE VEHICLE RIGHT IN & OUT
DATUMS
AHD / MGA
CLIENT No.
DRAWING No.
LN16146-P53
REVISION

Contact
Rebekah Ramm
(03) 6210 1402
rramm@pittsh.com.au

transport | community | mining | industrial | food & beverage | carbon & energy

Brisbane
Level 2
276 Edward Street
Brisbane QLD 4000
T: (07) 3221 0080
F: (07) 3221 0083

Canberra
PO Box 3124
Manuka ACT 2603
T: 1300 748 874

Devonport
Level 1
35 Oldaker Street
PO Box 836
Devonport TAS 7310
T: (03) 6424 1641
F: (03) 6424 9215

Hobart
199 Macquarie Street
GPO Box 94
Hobart TAS 7001
T: (03) 6210 1400
F: (03) 6223 1299

Launceston
Level 4
113 Cimitiere Street
PO Box 1409
Launceston TAS 7250
T: (03) 6323 1900
F: (03) 6334 4651

Melbourne
Level 1, HWT Tower
40 City Road
Southbank VIC 3006
PO Box 259
South Melbourne VIC 3205
T: (03) 9682 5290
F: (03) 9682 5292

Newcastle
Level 1
81 Hunter Street
Newcastle NSW 2300
T: (02) 4910 3600

Sydney
Suite 902, Level 9,
1-5 Railway Street
Chatswood NSW 2067
PO Box 5487
West Chatswood NSW 1515
T: (02) 9468 9300

E: info@pittsh.com.au
W: www.pittsh.com.au

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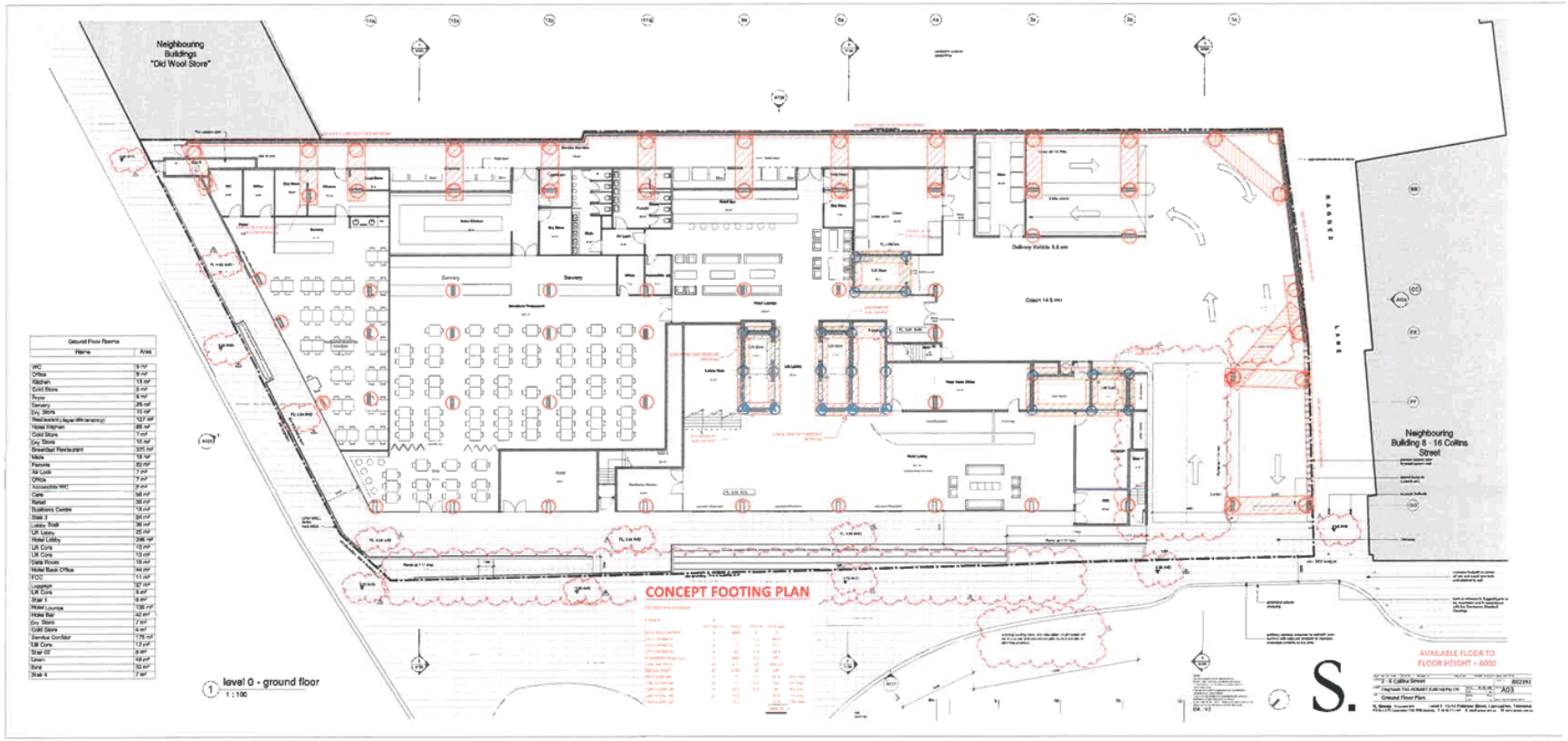
Neighbouring Buildings "Old Wool Store"
CONCEPT FOOTING PLAN
level 0 - ground floor
1 : 100
Neighbouring Building 8 - 16 Collins Street
AVAILABLE FLOOR TO FLOOR HEIGHT = 6000

Gmail by Google

Jit Sheng Gan <jit@sgroup.com.au>

Fwd: Assessment Email - PLN-16-1133 - 2 COLLINS STREET HOBART TAS 7000

Jonathan Buist <jono@sgroup.com.au> Thu, Feb 8, 2018 at 9:22 AM
To: Jit Sheng Gan <jit@sgroup.com.au>

just fyi.

Begin forwarded message:

From: Jonathan Buist <jono@sgroup.com.au>
Subject: Fwd: Assessment Email - PLN-16-1133 - 2 COLLINS STREET HOBART TAS 7000
Date: 8 February 2018 at 9:05:32 AM AEDT
To: Cameron Sherriff <sherriffc@hobartcity.com.au>
Cc: Samuel Haberle <sam@sgroup.com.au>, Kelvin Koh <kelvinkoh@fragrancegroup.com.sg>

Dear Cameron,
In terms of the scale of this project the excavation for this project is relatively minor, especially as it has no basement area at all.

Essentially any excavation will only be for footings, piers and service trenching. We don't yet have detailed engineering designs for the exact footing and trenching sizes (only schematic designs), but given that the site is 3009m2 it seems unlikely this would exceed 5000m2 by any large margin.

Kind Regards,

Jono

S. *Chase. Wonder.*

Jono Buist, Associate Architect *RAIA B Env Des B Arch*
Level 1, 10-14 Paterson Street, PO Box 1271, Launceston TAS 7250
P. (03) 6311 1403 M. 0408 361 071 W. sgroup.com.au

Begin forwarded message:

From: Samuel Haberle <sam@sgroup.com.au>
Subject: Fwd: Assessment Email - PLN-16-1133 - 2 COLLINS STREET HOBART TAS 7000
Date: 7 February 2018 at 4:14:02 PM AEDT
To: Jonathan Buist <jono@sgroup.com.au>

Sam

S. *Chase. Wonder.*

Sam Haberle, Director - Architecture *RAIA B Env Des B Arch, GAICD*
Level 1, 10-14 Paterson Street, PO Box 1271, Launceston TAS 7250
P. (03) 6311 1403 W. sgroup.com.au

Begin forwarded message:

From: <sherriffc@hobartcity.com.au>
Subject: Assessment Email - PLN-16-1133 - 2 COLLINS STREET HOBART TAS 7000
Date: 5 February 2018 at 11:52:40 am AEDT
To: <sam@sgroup.com.au>

Good morning Sam,

Although it has been some time since contact was made regarding this application, I was hoping you could confirm some information about your proposal that will assist in determining if a further external referral needs to be made.

A recent decision of the Full Court of the Supreme Court seems likely to have the implication that any proposed use and development that includes the excavation of 5000m3 or more of rock/gravel in a year is a quarry for the purposes of EMPCA. A quarry is a Level 2 Activity under EMPCA, and Level 2 Activities must be referred to the EPA board for assessment.

As such I seek confirmation of how much (in m3) rock/gravel excavation is likely to be required for this proposal. If it is 5000m3 or more, then I will need to refer your application to the EPA.

If you could provide confirmation with regard to this DA that would be greatly appreciated.

If you have any questions please get back to me.

Kind Regards,

Cameron Sherriff
Acting Senior Statutory Planner
6238 2742

entura Hydro Tasmania | The power of natural thinking

5 July 2018

Our ref: E306769

Kelvin Koh
Fragrance TAS_HOBART (Collins) Pty Ltd
kelvinkoh@fragrancegroup.com.sg

RE: 2-6 Collins Street – Flood Risk Assessment

Introduction

Entura was engaged by Fragrance TAS_HOBART (Collins) Pty Ltd to carry out a flood risk assessment for the proposed development at 2-6 Collins Street to address Hobart City Council's (HCC) request for information (RFI) SW1. The SW1 RFI is provided below.

Stormwater

SW1 Council records indicate the site is subject to flooding from both Hobart Rivulet and Park Street Rivulet.

Please submit a Flood Risk Assessment, and associated calculations and plans, which demonstrates the development will provide a safe working and living environment for users of the site and surrounding area (including Council land and roads). This report must detail the impact of the development on flood depth, extent, velocity and duration on third-party land; as well as discuss risk to the development itself and any proposed mitigation measures. The report must include proposed floor levels, mapping comparing pre and post-development, and hazard band mapping. Flood assessment must include 1% AEP with climate change loading, however impact of the development on more frequent events should also be discussed.

This revised report addresses Hobart City Council's comments on the initial report (1 March 2018) submitted by Entura. Specifically the modelling has been updated based on revised catchment and a 20% increase in rainfall due to climate change (2100 climate) has been adopted to be consistent with recent flood study work carried out for Hobart Rivulet and New Town Rivulet. Also, as indicated by Council, presentation of 10% AEP flood results are not necessary and as such the previous modelling for this event has not been updated and 10% AEP modelling results have been removed from this report.

Proposed development

The site plan for the proposed development is provided in Attachment A and shows the following:

- The proposed ground floor level is 4.6m AHD.
- A ramp up from Collins Street will be provided for vehicle access and will finish at a level of 4.6m AHD.

There is no underground parking at the proposed development.

Referring to Figure 1 the development site is located at the confluence of Hobart Rivulet and Park Rivulet. Park Rivulet is fully piped with a 1.8m diameter reinforced concrete pipe (RCP) joining Hobart Rivulet. Overland flow that is in excess of the pipe capacity has the potential to affect the development site. Previous work (Entura, 2014) has identified that during large flood events Hobart Rivulet can discharge flow onto Collins Street near the Royal Hobart Hospital.

Figure 1. Location of 2-6 Collins Street and existing stormwater infrastructure and flow paths

Site visit

Entura carried out a site visit to gain understanding of the local site and overland flow paths. In the vicinity of the development locations where water could easily enter existing surrounding structures (ie driveways, laneways) was noted.

Flood model

Entura completed the latest Hobart Rivulet Flood Study in 2014. However this model did not considered overland flow along Park Rivulet. As noted in HCC request for information the development site can potentially be affected by overland flow along Park Rivulet.

A coupled hydrologic and 1D/2D hydraulic XP SWMM (Ver 2017.2) model for the Park Rivulet catchment was developed to carry out the flood risk assessment for the development in conjunction with MIKE Flood modelling results from the previous Hobart Rivulet Flood Study.

The layout of the XP SWMM model is shown in Figure 2. The following data was available to develop the model:

- Mt Wellington LiDAR over the entire catchment.
- Database of pipe locations and diameters provided by HCC. Invert levels were not available.

- ARR 2016 storms characteristics consisting of IDFs, Temporal Patterns, ARF Parameters and Interim Climate Change Factors. The data and information corresponding to the considered location are extracted from http://data.arr-software.org.
- Results from the previous Hobart Rivulet Flood Study (Entura, 2014) including:
  - Hydrographs of the spill from Hobart Rivulet (near the Royal Hobart Hospital). Interrogating the previous modelling results identified that the Hobart Rivulet channel capacity downstream of the spill location is approximately 30 m^3/s.
  - Water levels in Hobart Rivulet at the confluence with Park Rivulet for use as tailwater levels for the Park Rivulet outfall.

The XP SWMM model was built based on the following:

- Sub-catchments were derived from LiDAR contours considering on key flow paths and were connected directly to 1D manholes in the model.
- Overland flow was modelled in 2D using a 3m grid derived from the Mt Wellington LiDAR.
- The trunk underground pipe network of Park Rivulet was coarsely modelled to enable the impact of capacity of the trunk pipe on overland flow to be considered. It was assumed that stormwater inlet pits and culverts within the overall drainage network would have the capacity to admit flow into the pipe network, up to the capacity of the pipe network. The trunk pipe alignments were based on a GIS database provided by HCC (not all manholes and pipes modelled) with manholes connected to the 2D grid to enable flow to pass between the surface and the underground pipe system. Inlet pits and their capacities were not included in the model. Pipe inverts were not available and 0.6m cover to the top of pipes was typically assumed to estimate the invert levels.
- Manholes used to define the trunk network were set to enable flow to freely pass between the pipe network and the surface.
- Manhole lid levels were based on Mt Wellington LiDAR at the location of the assumed nodes on the model.
- A fixed water level of 3.0m AHD at the Park Rivulet pipe outfall was adopted. It is not the peak water level in Hobart Rivulet for the 1% annual exceedence probability (AEP) flood event but is a reasonable representation of the water level in Hobart Rivulet over time.
- Design rainfall losses and temporal patterns from Australian Rainfall and Runoff (ARR) and design rainfall depths from the Bureau of Meteorology (BoM) were used in the hydrologic modelling.
- Apart from near the development area all buildings were modelled as a high roughness value.
- Near the site buildings were modelled as hard structures with openings at appropriate locations (ie driveways and doors) to admit water, hence considering storage volume of the floodplain near the site. Refer to Figure 3.
- For the existing case the ground level of the development site was based on Mt Wellington LiDAR and flow into the site was assumed to be blocked apart from the existing driveway entry.
- For the developed case the site was assumed to be fully raised above flood levels.
- There is a low point in the Park Creek overland flow path just upstream of Brisbane Street. This low point is captured in the 2D model terrain. A node representing a manhole was located at the invert of the low point to enable flow transfer between the surface and underground pipe

network. A sensitivity check was carried out where manholes in the low area were assumed to be blocked. There was found to be no significant impact on modelling results.

- A fixed ocean level was assumed for the downstream model boundary. The assumed level does not impact predicted water levels at the development site.
- Flood discharge from Hobart Rivulet at the Royal Hobart Hospital was taken from MIKE Flood hydraulic modelling for the Hobart Rivulet Flood Study completed by Entura in 2014. This study identified that Hobart Rivulet has a capacity of approximately $30m^3/s$ downstream of the hospital. Flow in excess of this amount was assumed to discharge onto Collins Street. The flow from Hobart Rivulet was evenly distributed onto the 2D grid as shown in Figure 2. Refer to Appendix B
- The critical duration identified for Hobart Rivulet is 6hrs, as identified in the Hobart Rivulet Flood Study completed by Entura in 2014.
- A 20% increase in design rainfall depths was assumed for the 2100 climate scenarios. This increase was based on rainfall increases adopted for the recent Hobart Rivulet and New Town Rivulet flood studies (Entura, 2014).
- Manning's n of 0.3 for buildings and heavily urbanised areas and 0.019 for road reserves.
- Initial and continuing losses:
  - Pervious area: Initial and continuing losses of 28 mm and 3.7 mm/hr respectively
  - Impervious area: Initial and continuing losses of 0 mm and 0 mm/hr respectively

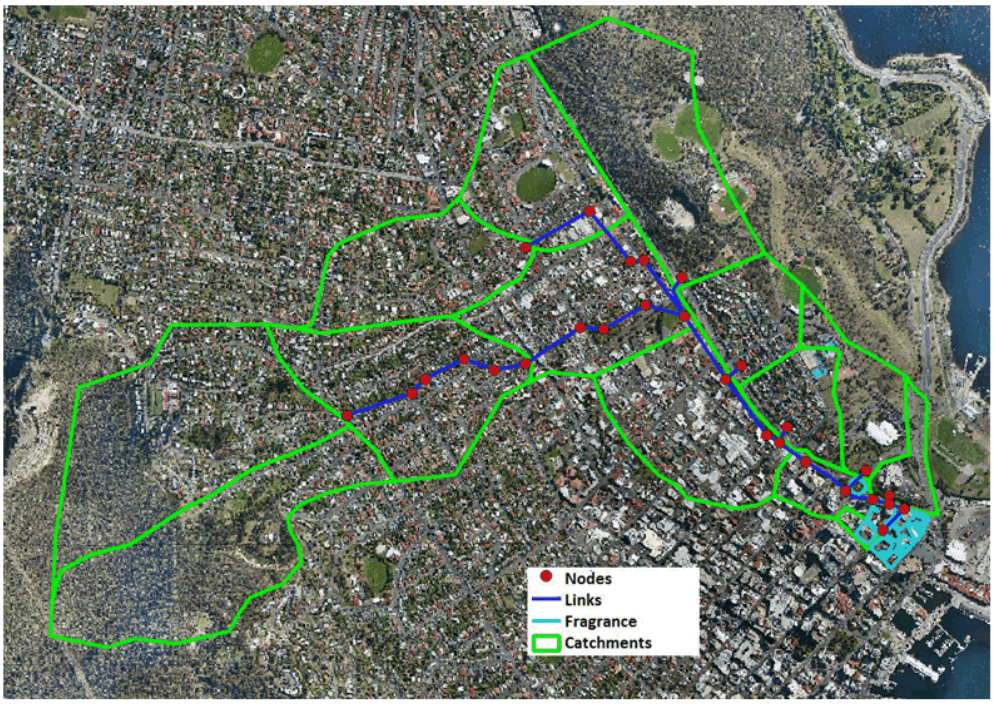

Figure 2. Model delineation including nodes (pits), links (pipes), Fragrance (proposed development) and the subcatchmentss

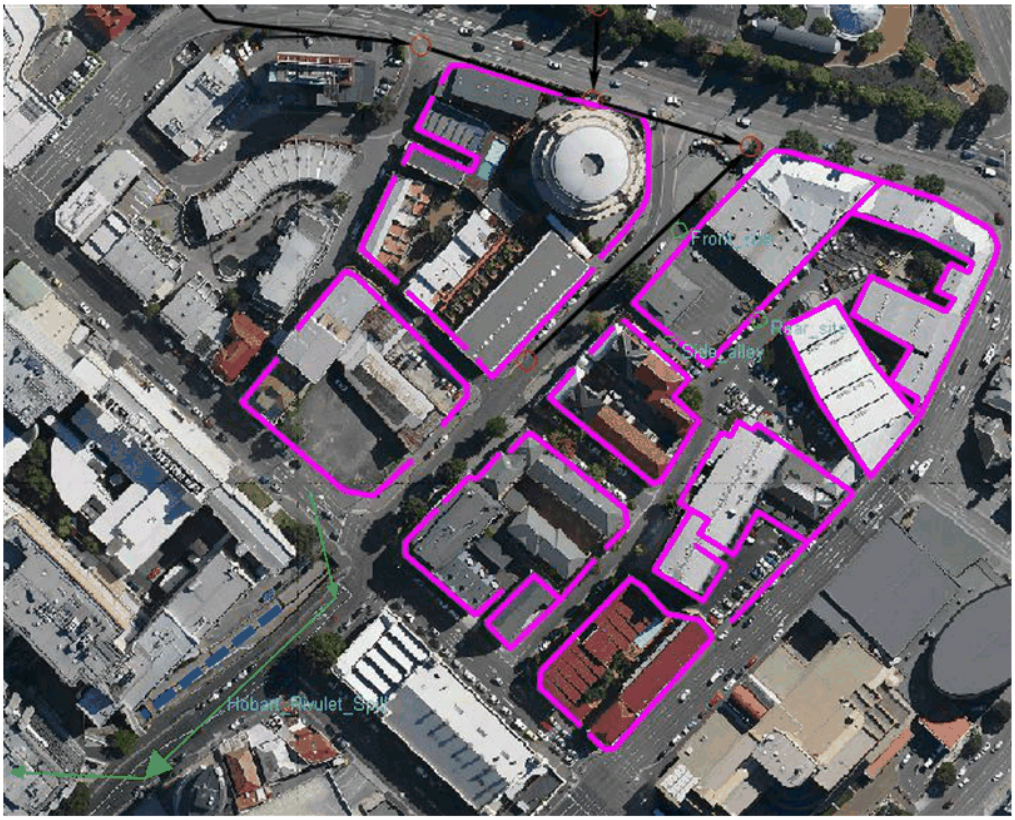

Figure 3. Surrounding areas of the development zone (pink lines) including three check points around development zone (bluish circles: front site, side alley, and Rear site), as well as the potential spill location of Hobart Rivulet in front of Royal Hobart hospital (in dash blue line).

Modelling scenarios

The scenarios considered for this study are summarised below:

1. 1% AEP with/without climate change: Park Rivulet critical duration flood, existing site.
2. 1% AEP with/without climate change: Park Rivulet critical duration flood, proposed development.
3. 1% AEP with/without climate change: Hobart Rivulet critical duration flood (6hr), existing site.
4. 1% AEP with/without climate change: Hobart Rivulet critical duration flood (6hr), proposed development.

Estimation of critical duration and peak flood discharge verification for Park Rivulet

Unlike the process documented in the previous report, it was not attempted to determine the critical duration event and critical duration temporal pattern through preliminary modelling and then run those specific scenarios through the more detailed XP-SWMM model. The full ensemble of temporal patterns were run through the XP-SWMM hydrologic/hydraulic model for the 10min to 6 hr duration storm events.

The maximum flood results (extent, level, hazard) documented in this report were based on median temporal pattern from the envelope of 10 point temporal patterns from AR&R 2016 Data Hub (http://data.arr-software.org/)for each duration flood.

It was found that the critical duration storm around the site varied between 10min (Brooker Avenue) and 1-2hr (Collins Street).

Results

The coupled hydrologic and 1D/2D hydraulic XP SWMM model was run for the four scenarios listed above.

In summary it was identified that:

- The Park Rivulet critical duration flood event results in higher water levels in the vicinity of the development site when compared to the Hobart Rivulet critical duration event (6hr). The results presented below are based on Park Rivulet critical duration events. The flood extent/level and flood hazards maps for the Park Rivulet critical duration flood are provided in Appendix C.
- The area upstream of Brisbane Street which can store overland flow has a significant attenuation effect on overland flow.
- The critical duration flood around the upstream side of the development site (Collins Street and Brooker Ave) varies from 10 minutes in Brooker Ave (associated with local stormwater runoff from the catchment to the north) and 1hr to h2rs in Collins Street (associated with the larger Park Rivulet catchment).
- The highest water levels adjacent to the site (for all scenarios) are in Brooker Avenue. The water levels adjacent to the existing building to the modelled 1% AEP scenarios are typically 4.2m AHD to 4.3m AHD. In Collins Street near the existing driveway the peak 1% AEP water levels are between 3.8m AHD and 3.9m AHD. All noted water levels are based on the median temporal pattern.
- The existing site is predicted to be inundated by the existing case and 2100 climate 1% AEP floods, which climate change increasing flood levels in Brooker Avenue by approximately 0.04m and in Collins Street by approximately 0.06m.
- The proposed development results in an increase in water level in Collins Street by up to 0.02 to 0.03m and was found to have no impact on water levels in Brooker Avenue. The increase in flood depth in Collins Street will be on top of flood depths of approximately 0.3m to 0.5m and therefore the increase in flooding will not have a noticeable impact on what would occur without the development in place. Flood level difference maps are provided in Appendix D.
- The highest 1% AEP predicted 2100 climate water level adjacent to the developed site is modelled to be approximately 4.31m AHD and is located at the eastern side of the development boundary on Brooker Avenue. From that location the peak water levels reduce to 4.2m AHD at the intersection of Brooker Avenue and Collins Street, and 3.92m AHD in Collins Street at the existing site driveway. The proposed floor level of 4.6m AHD is 0.29m above the highest water level and greater than 0.3m above peak water levels for the majority of the site boundary. The proposed floor level of 4.6m AHD is considered to satisfy the required freeboard criteria. It should be noted that the peak water levels in Brooker Avenue are associated with runoff from a local catchment and not directly associated with a Park Rivulet flood event.

- Flood hazard was assessed using the latest ARR guidelines. Table E.1 presents Combined Hazard Curves - Vulnerability Thresholds Classification Limits used to define flood hazard. Figures E1 to E4 present the spatial maps of maximum flood hazard in the vicinity of the site for the 1% AEP flood event.
- Flood hazard along Collins Street near the site is typically H1 or H2 (some H3) for the modelled cases. Both climate change and the proposed development result in a small but not significant increase in hazard with a greater proportion of H2 and H3.
- In the Ragged Ln adjacent to the site and behind the site flood hazard is not significantly changed due to the development.

Conclusions

- The proposed works will not have any significant impact on flooding in the surrounding area for the 1% AEP flood event (existing and predicted 2100 climate).
- Climate change is predicted to increase flood levels adjacent to the site in Collins Street and Brooker Avenue by up to 6cm.
- The proposed works will not have a significant impact on flood hazard for the 1% AEP flood event (existing and 2100 climate).
- Flood hazard in front of the site, including near the proposed vehicle entry/exit, for the 1% AEP 2100 climate event is low (H1 to H2).
- The proposed floor level of 4.6m AHD is 0.29m above the highest 1% AEP 2100 climate flood level (Brooker Avenue – eastern end of the site) and is typically greater than 0.3m above peak flood levels for the remainder of Brooker Avenue and Collins Street. The development is considered to satisfy the required freeboard criteria of 0.3m for the 1% AEP 2100 climate flood event.

Recommendations

It is recommended that during the detailed design of the proposed development a detailed drainage study should be carried out for the local catchment just to the north of the site (covering the catchment bounded by the Tasman Highway, Liverpool Street and Brooker Avenue). This detailed study should model the local drainage network in detail to confirm flow conveyance capacity of Brooker Street and identify the need, if required, for any minor drainage works for the 1% AEP flood event.

Please let me know if you have any comments or questions.

Yours sincerely

Craig Ludlow
Specialist Engineer
p 03 6245 4102
m 04 09 270 816
e craig.ludlow@entura.com.au

References

Entura, 2014, Hobart Rivulet Flood Study, ENTURA-6A9CS.

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Appendices

Appendix A – Proposed development plans

Appendix B – Discharge from Hobart Rivulet onto Collins Street

Appendix C – 1% AEP flood event – maximum water surface level maps

Appendix D – 1% AEP flood event – maximum water level difference maps

Appendix E – 1% AEP flood event – maximum flood hazard maps

89 Cambridge Park Drive Cambridge TAS 7170 Australia • GPO Box 355 Hobart TAS 7001 Australia
t +61 3 6245 4500 f +61 3 6245 4550 e info@entura.com.au w www.entura.com.au
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Appendix A –Proposed development plan

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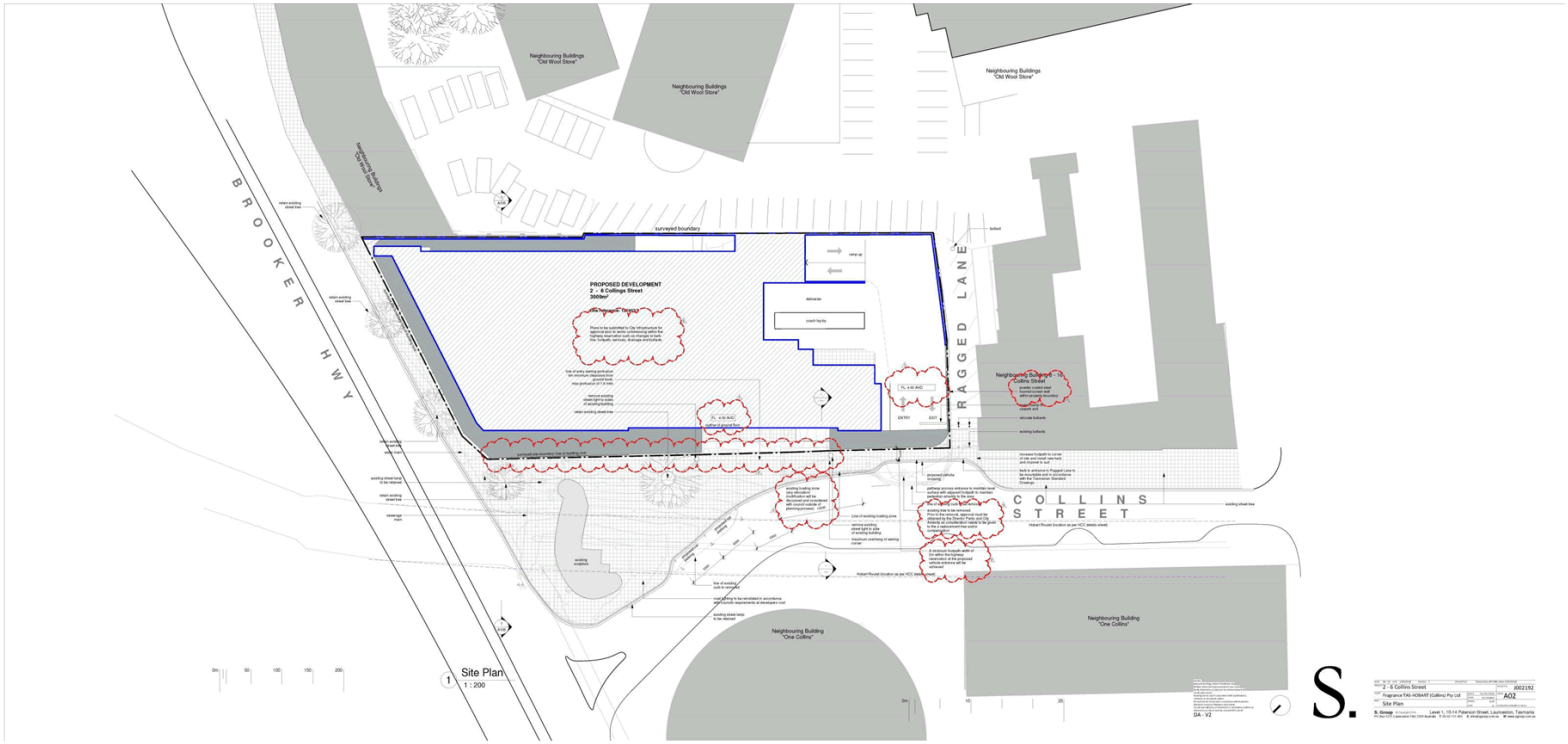

Figure A.1 Proposed development site plan

89 Cambridge Park Drive Cambridge TAS 7170 Australia • GPO Box 355 Hobart TAS 7001 Australia
t +61 3 6245 4500 f +61 3 6245 4550 e info@entura.com.au w www.entura.com.au
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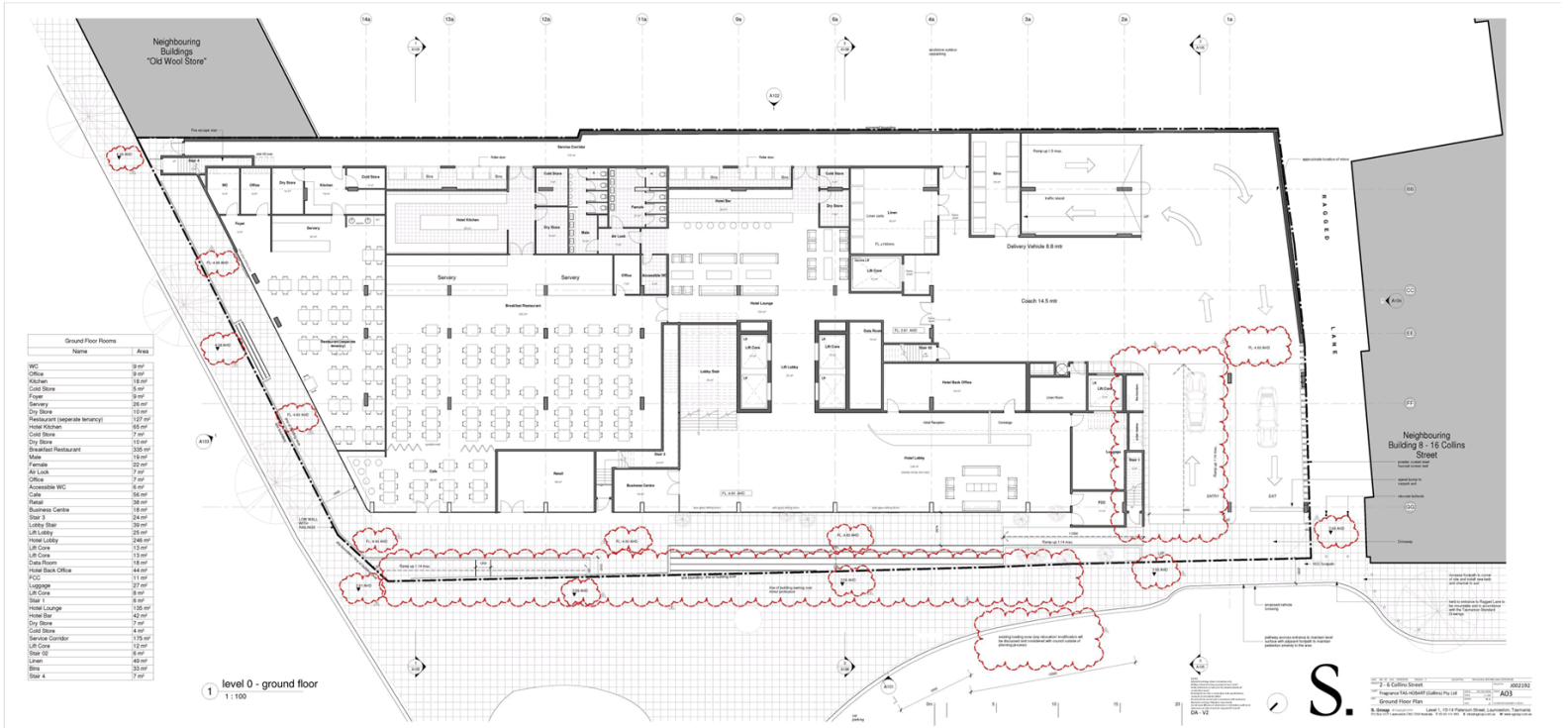

Figure A.2 Proposed development ground floor plan

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Appendix B – Discharge from Hobart Rivulet onto Collins Street

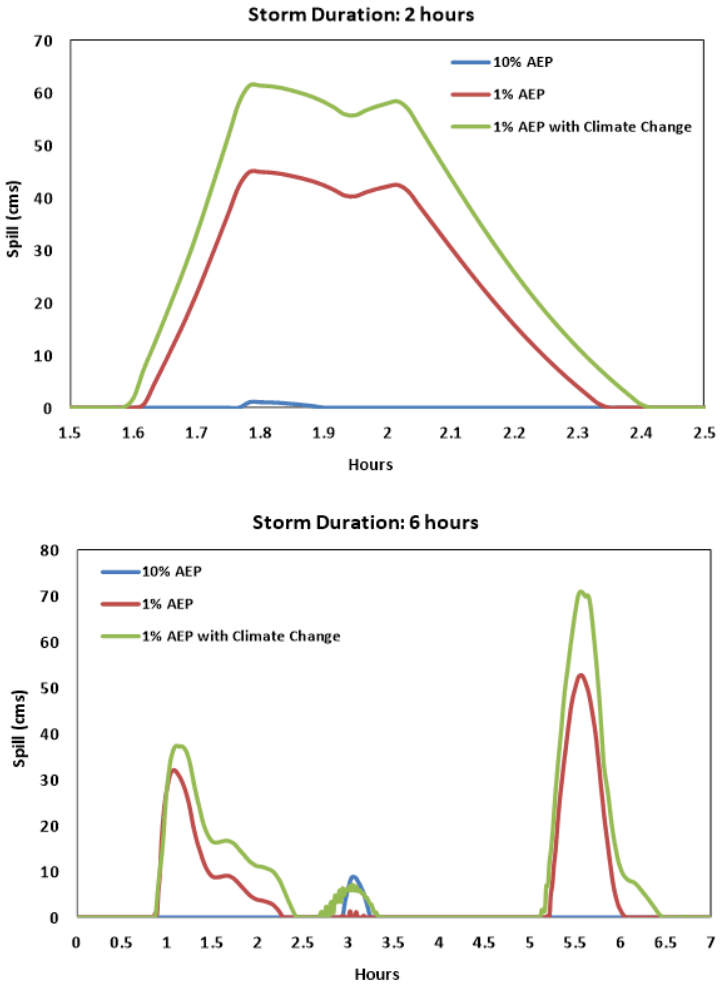

Figure B.1. Spill hydrographs from Hobart Rivulet at the location of Royal Hobart hospital based on critical durations of 2 hours (Park Rivulet catchment) and 6 hours (Hobart Rivulet catchment).

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Appendix C – 1% AEP – maximum water level maps

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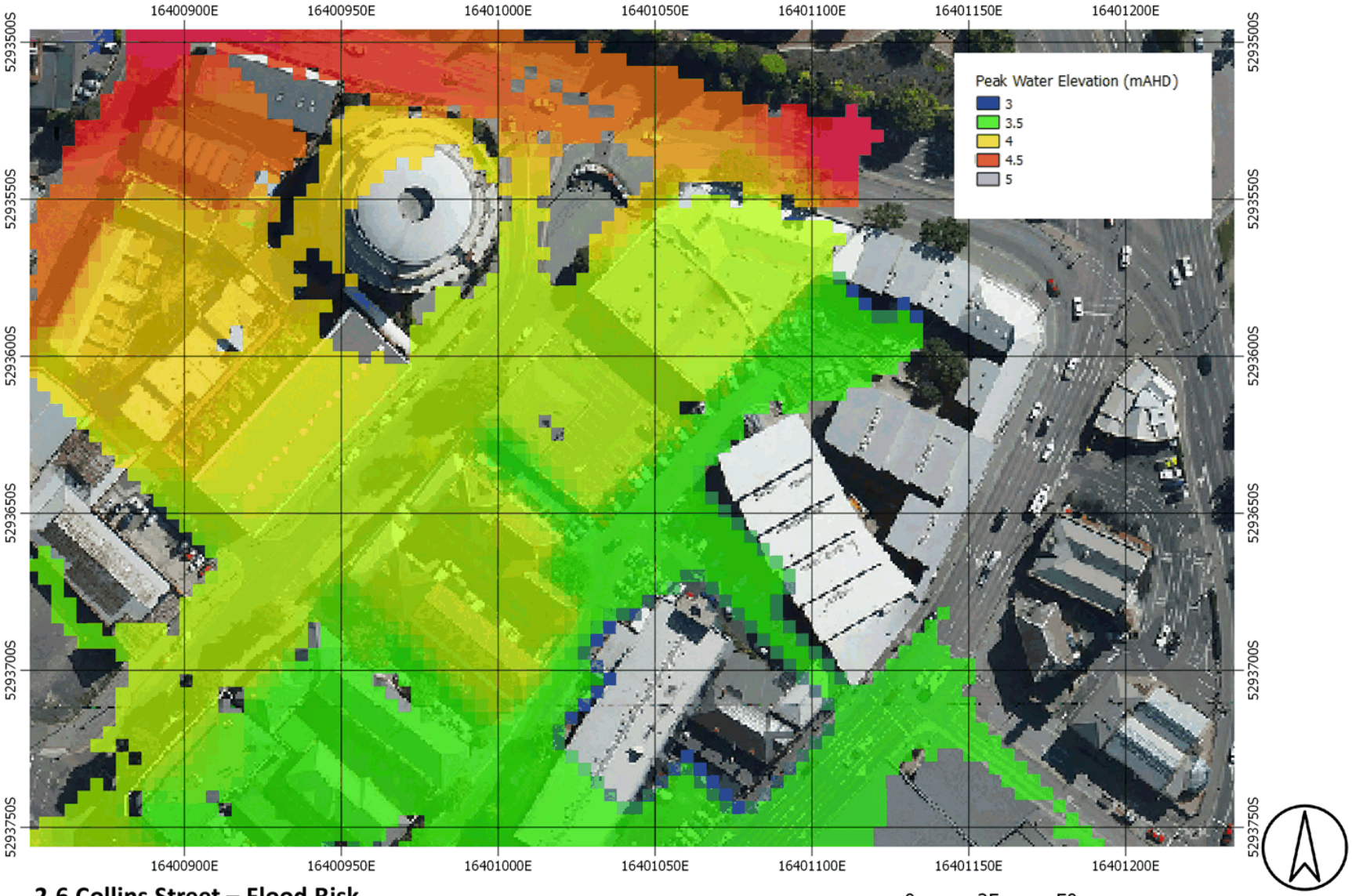

2-6 Collins Street – Flood Risk

Collins St Flood Inundation Elevation Map for the existing climate without Frangrance developement

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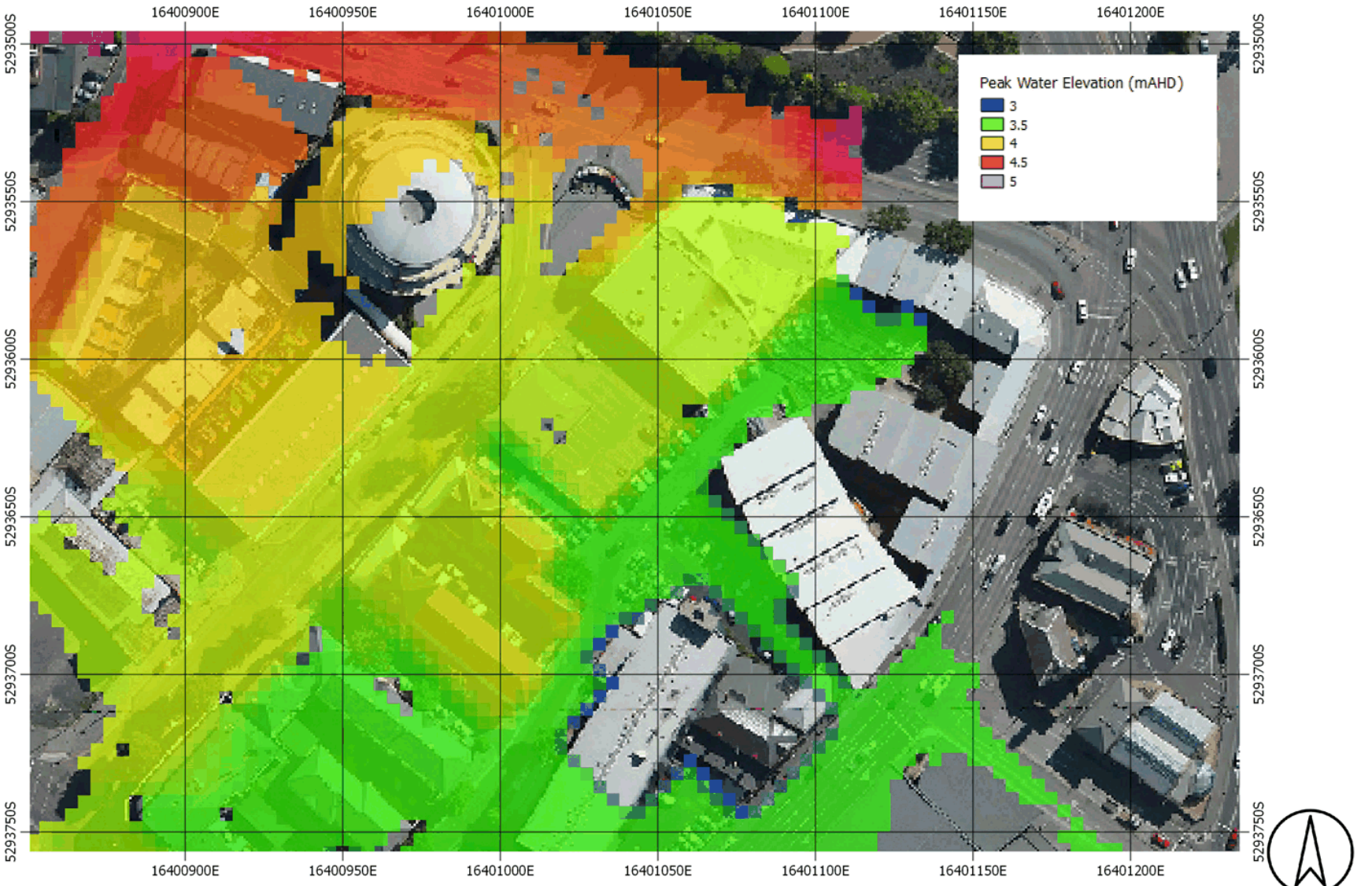

2-6 Collins Street – Flood Risk

Collins St Flood Inundation Elevation Map for a predicted 2100 climate without Frangrance developement

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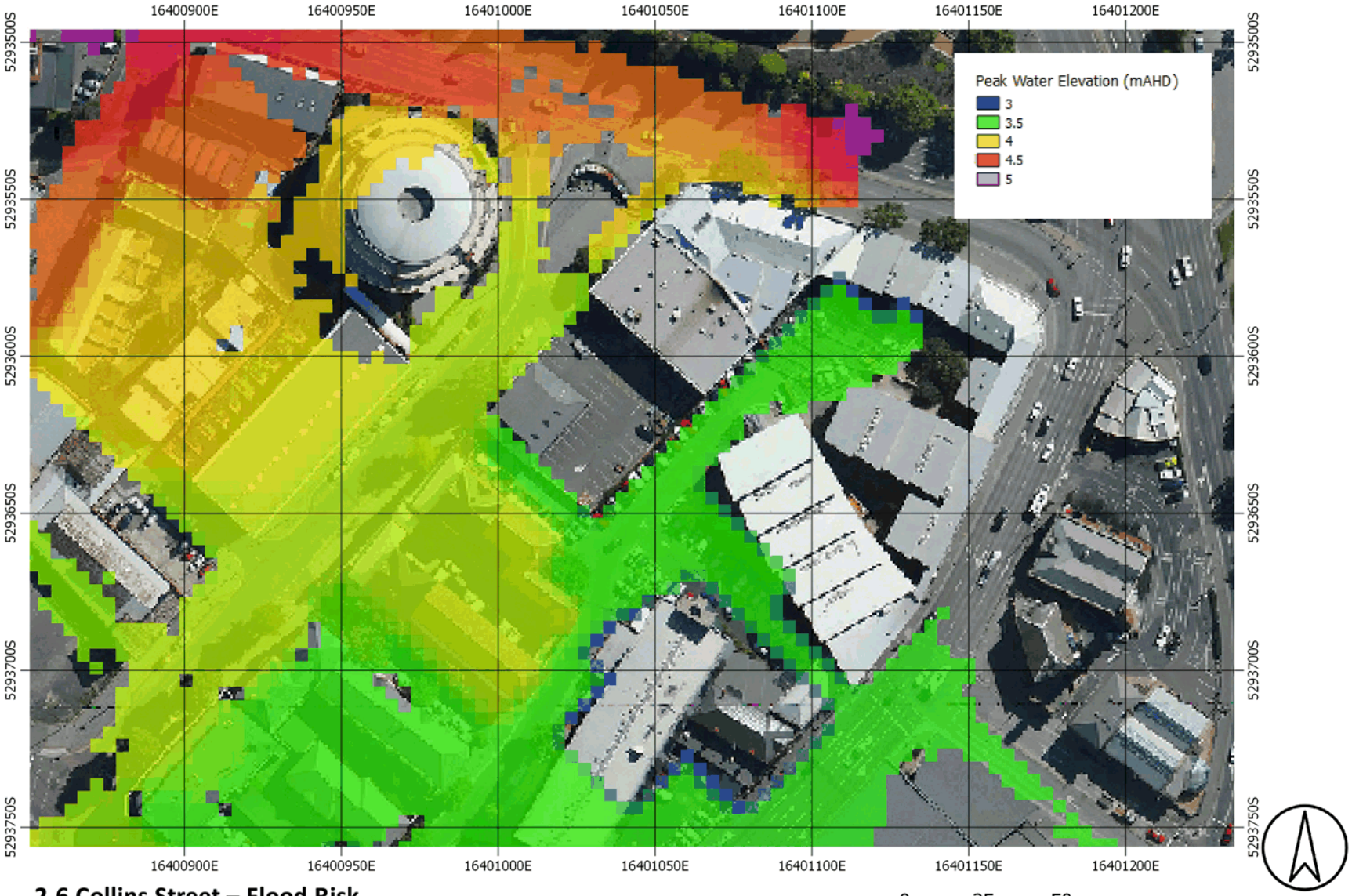

2-6 Collins Street – Flood Risk

Collins St Flood Inundation Elevation Map for the existing climate with Frangrance developement

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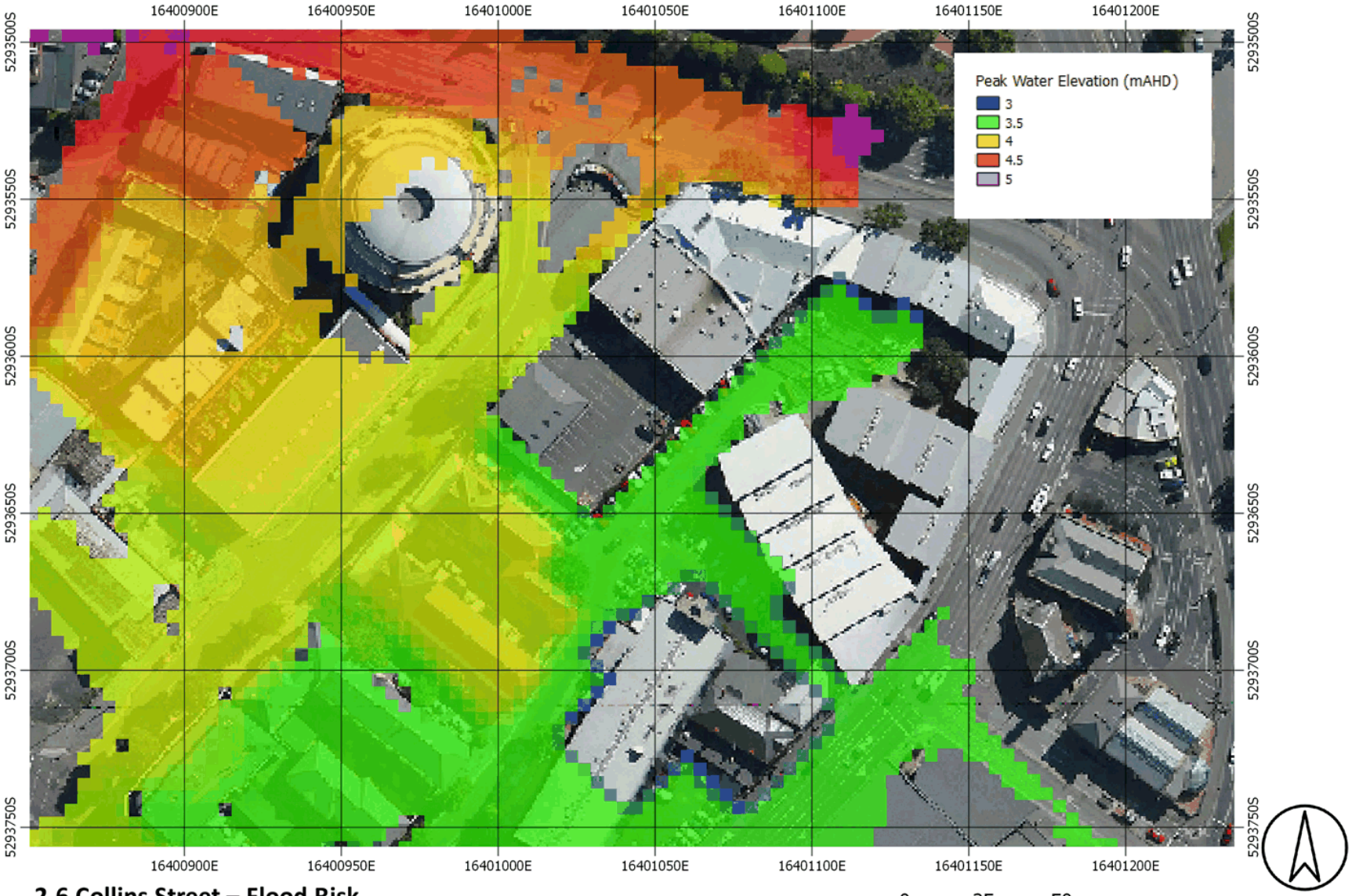

2-6 Collins Street – Flood Risk

Collins St Flood Inundation Elevation Map for a predicted 2100 climate with Frangrance developement

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Appendix D – 1% AEP flood event – maximum water level difference maps

89 Cambridge Park Drive Cambridge TAS 7170 Australia • GPO Box 355 Hobart TAS 7001 Australia
t +61 3 6245 4500 f +61 3 6245 4550 e info@entura.com.au w www.entura.com.au
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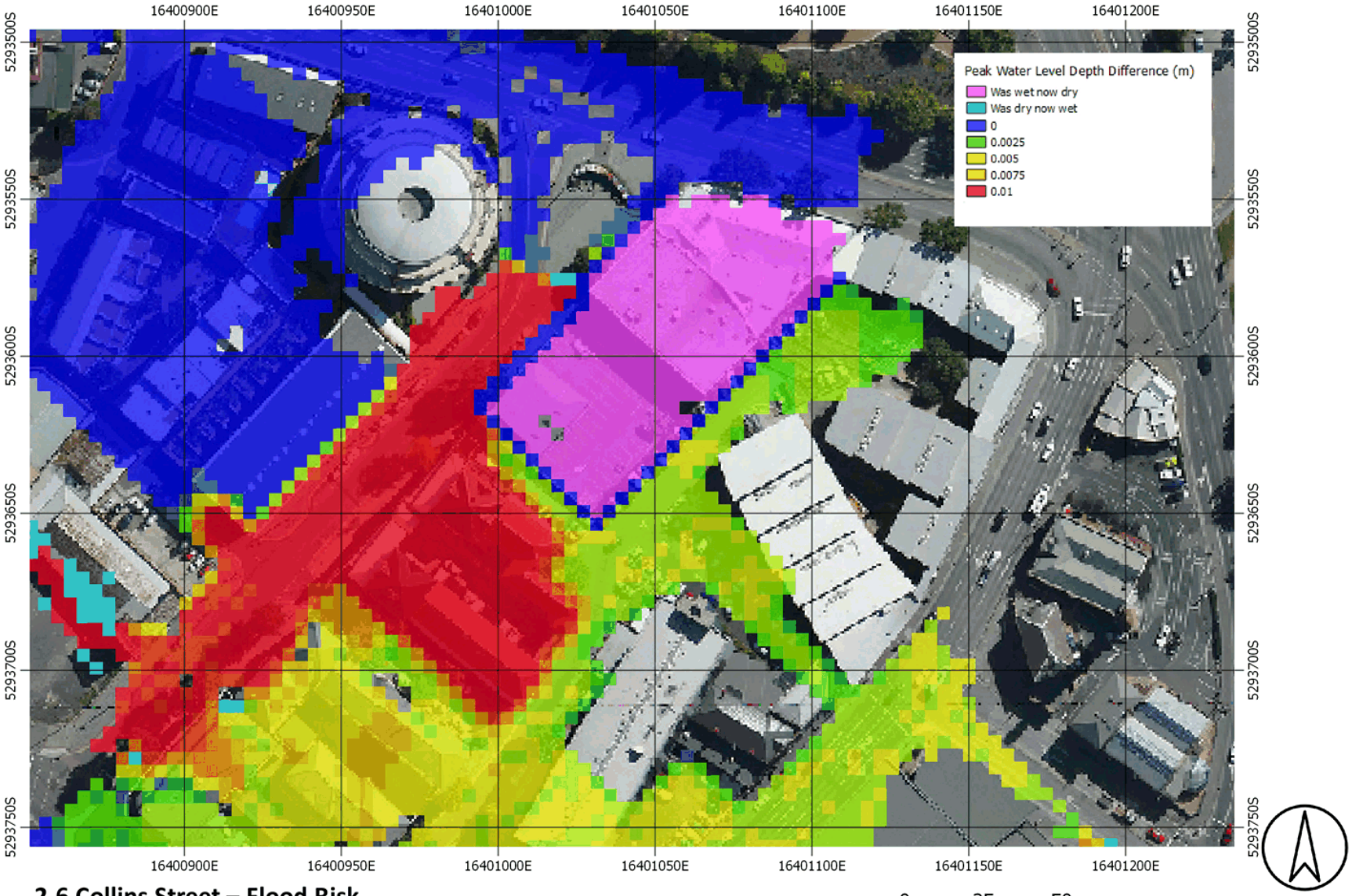

2-6 Collins Street – Flood Risk

Collins St Flood Inundation Difference Map for the existing climate with Frangrance developement

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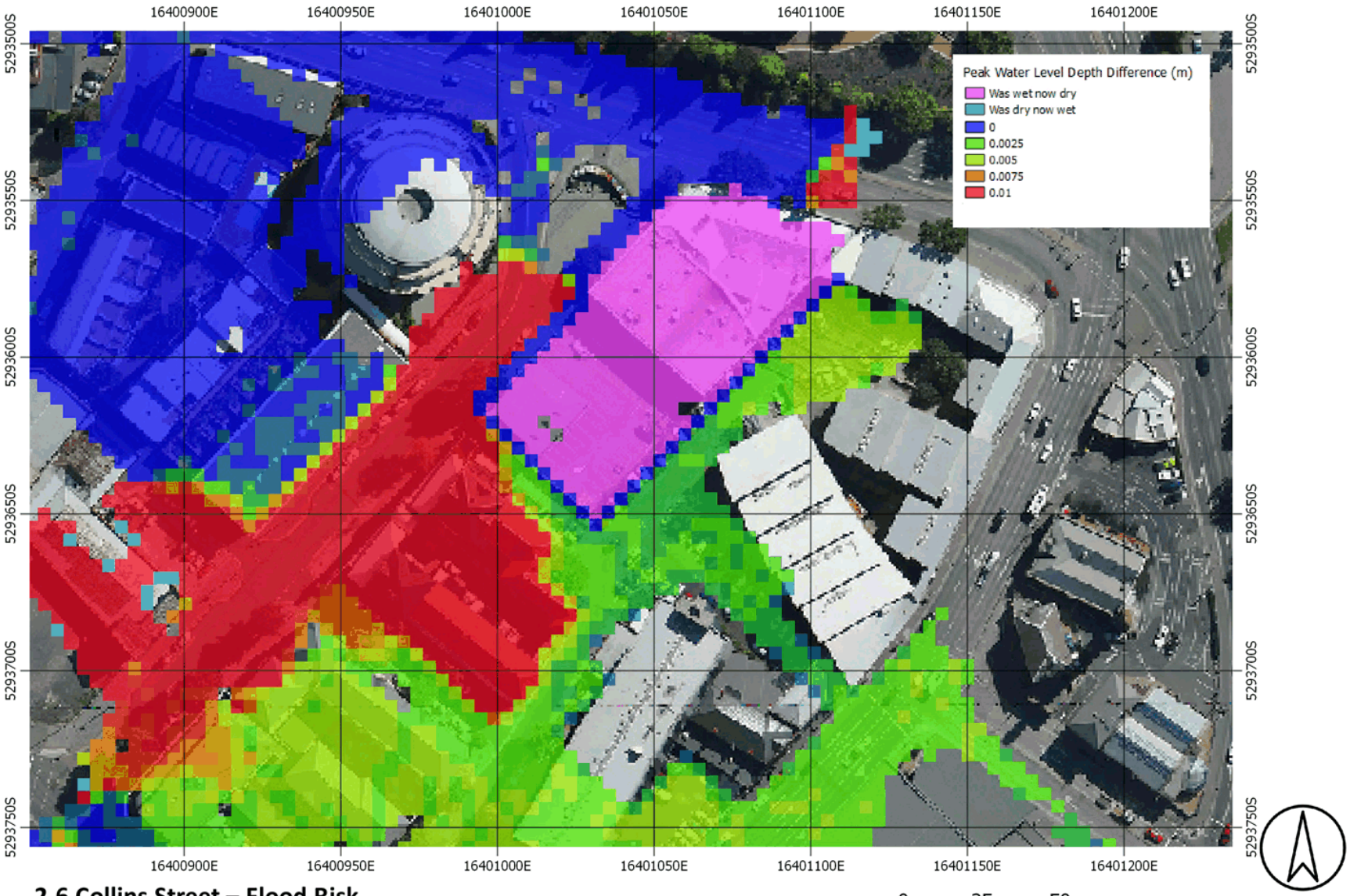

2-6 Collins Street – Flood Risk

Collins St Flood Inundation Difference Map for a predicted 2100 climate with Frangrance developement

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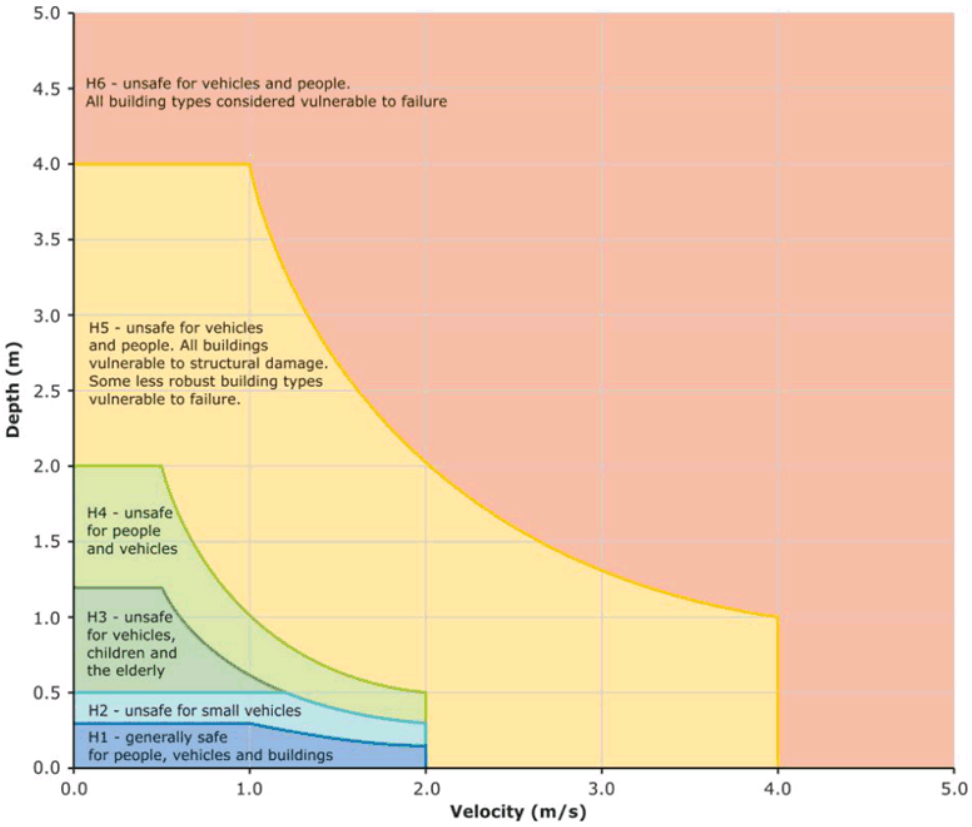
Appendix E –1% AEP – maximum flood hazard maps

Table F.1. Combined Hazard Curves - Vulnerability Thresholds Classification Limits (Smith et al, 2014).

Hazard Vulnerability Classification	Classification limit (D×V) m^2/s	Limiting still water depth (D) m	Limiting velocity (V) m/s
H1: Generally safe	≤ 0.3	0.3	2
H2: Unsafe for small vehicles	≤ 0.6	0.5	2
H3: Unsafe for vehicles, children and the elderly	≤ 0.6	1.2	2
H4: Unsafe for vehicles and people	≤ 1	2	2
H5: Unsafe for vehicles, people and some buildings	≤ 4	4	4
H6: Unsafe for all vehicles, people and buildings	> 4	---	---



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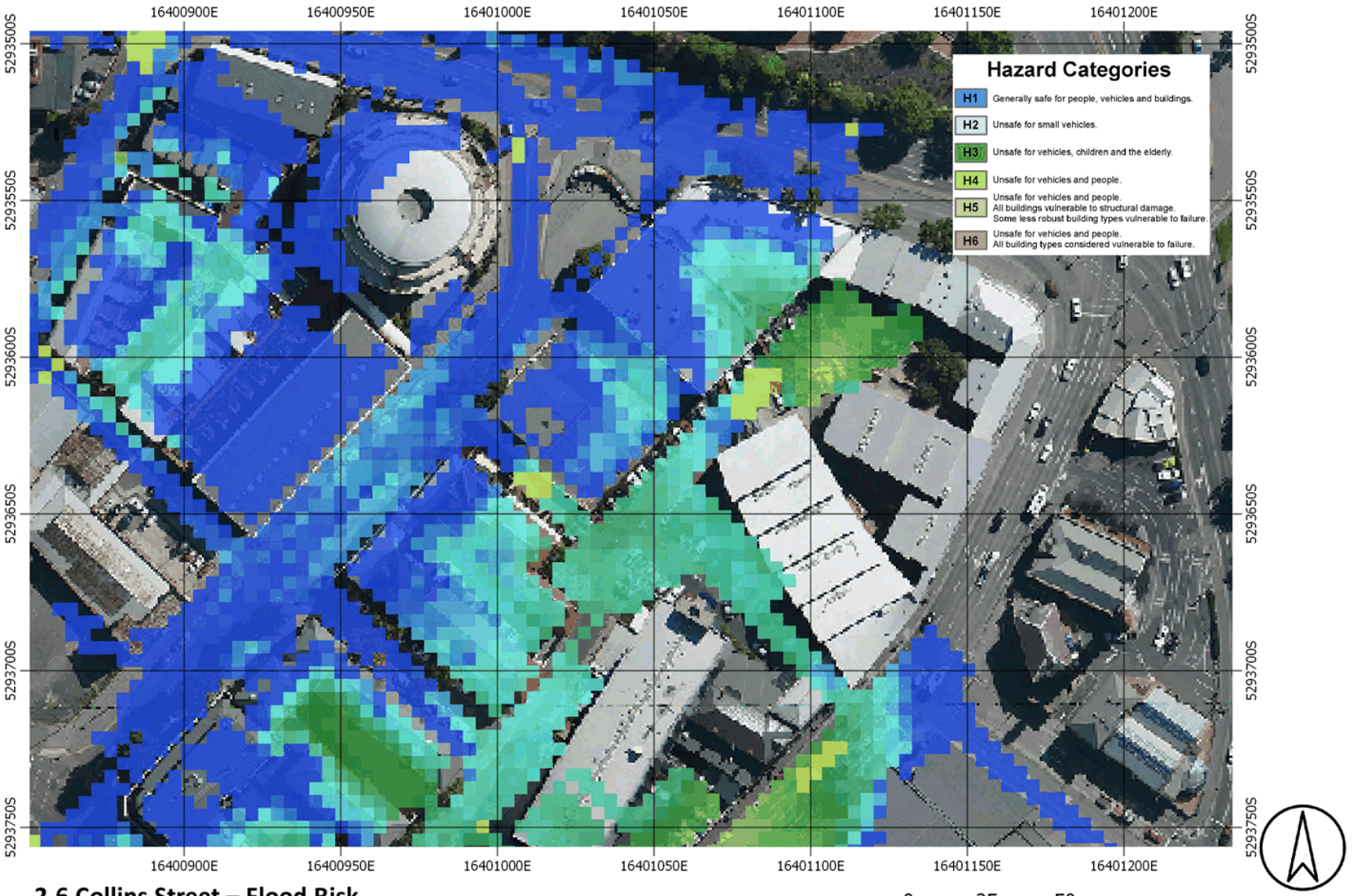

2-6 Collins Street – Flood Risk

Collins St Flood Hazard Map for the existing climate without Frangrance developement

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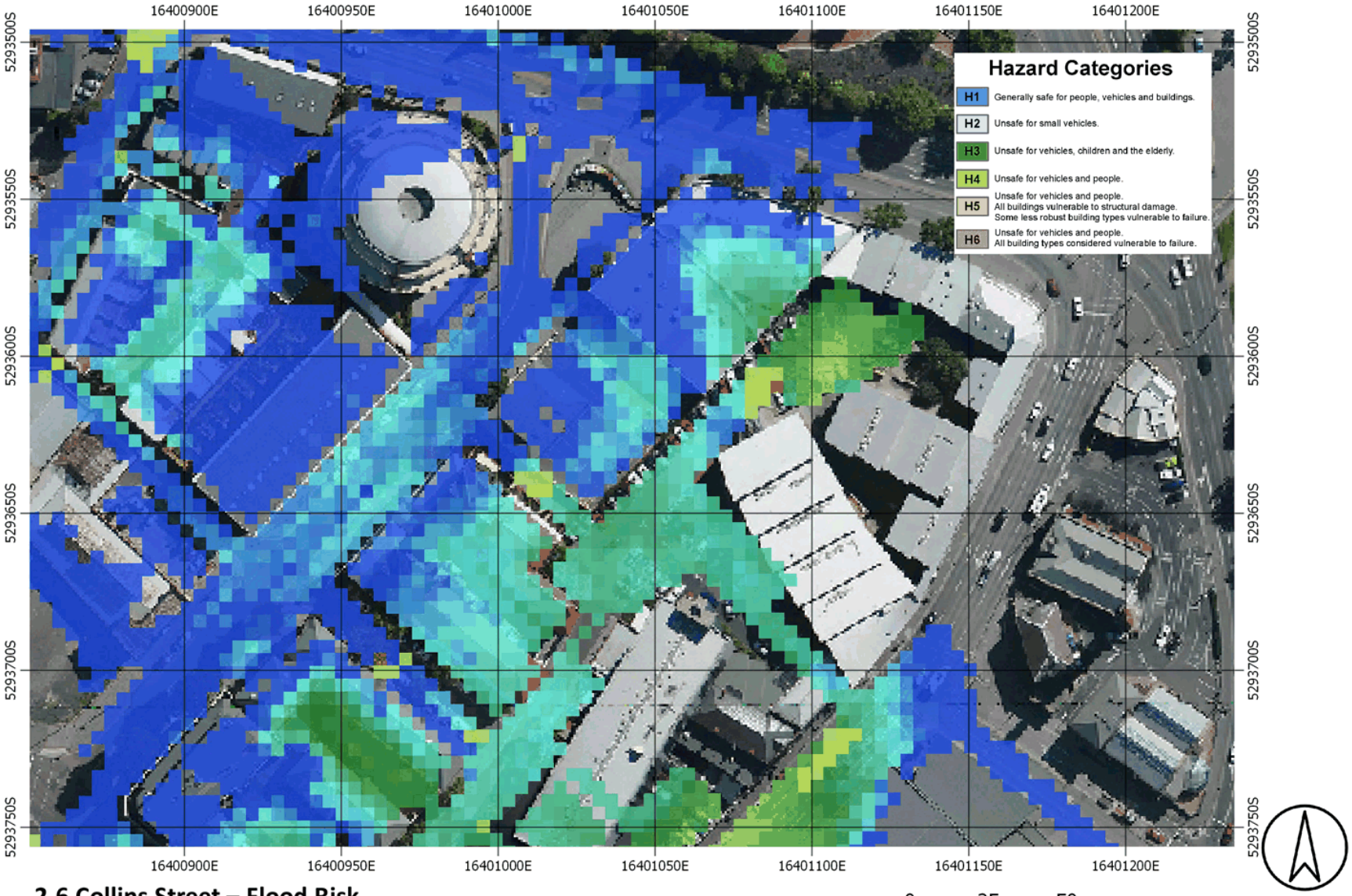

2-6 Collins Street – Flood Risk

Collins St Flood Hazard Map for a predicted 2100 climate without Frangrance developement

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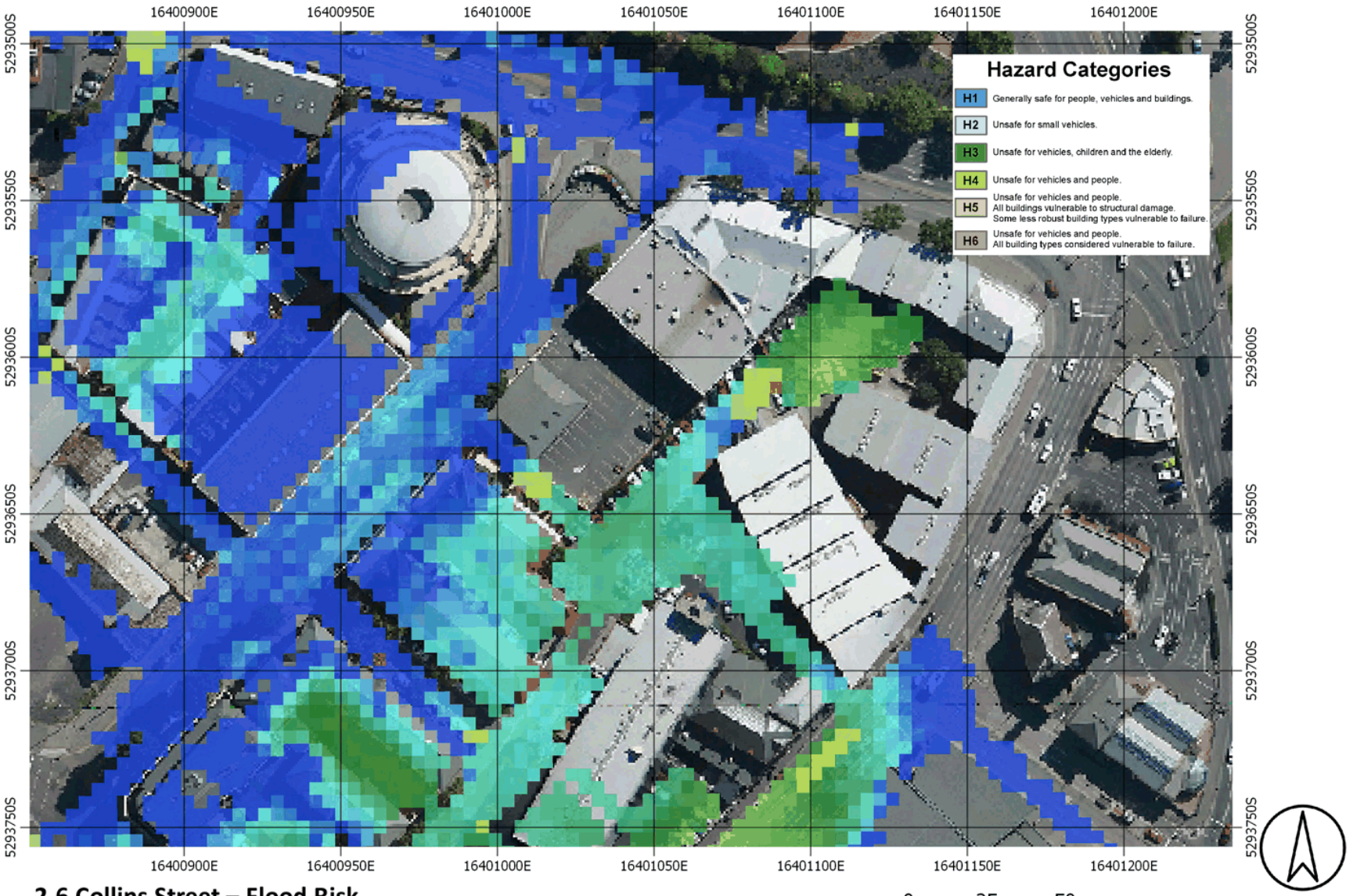

2-6 Collins Street – Flood Risk

Collins St Flood Hazard Map for the existing climate with Frangrance developement

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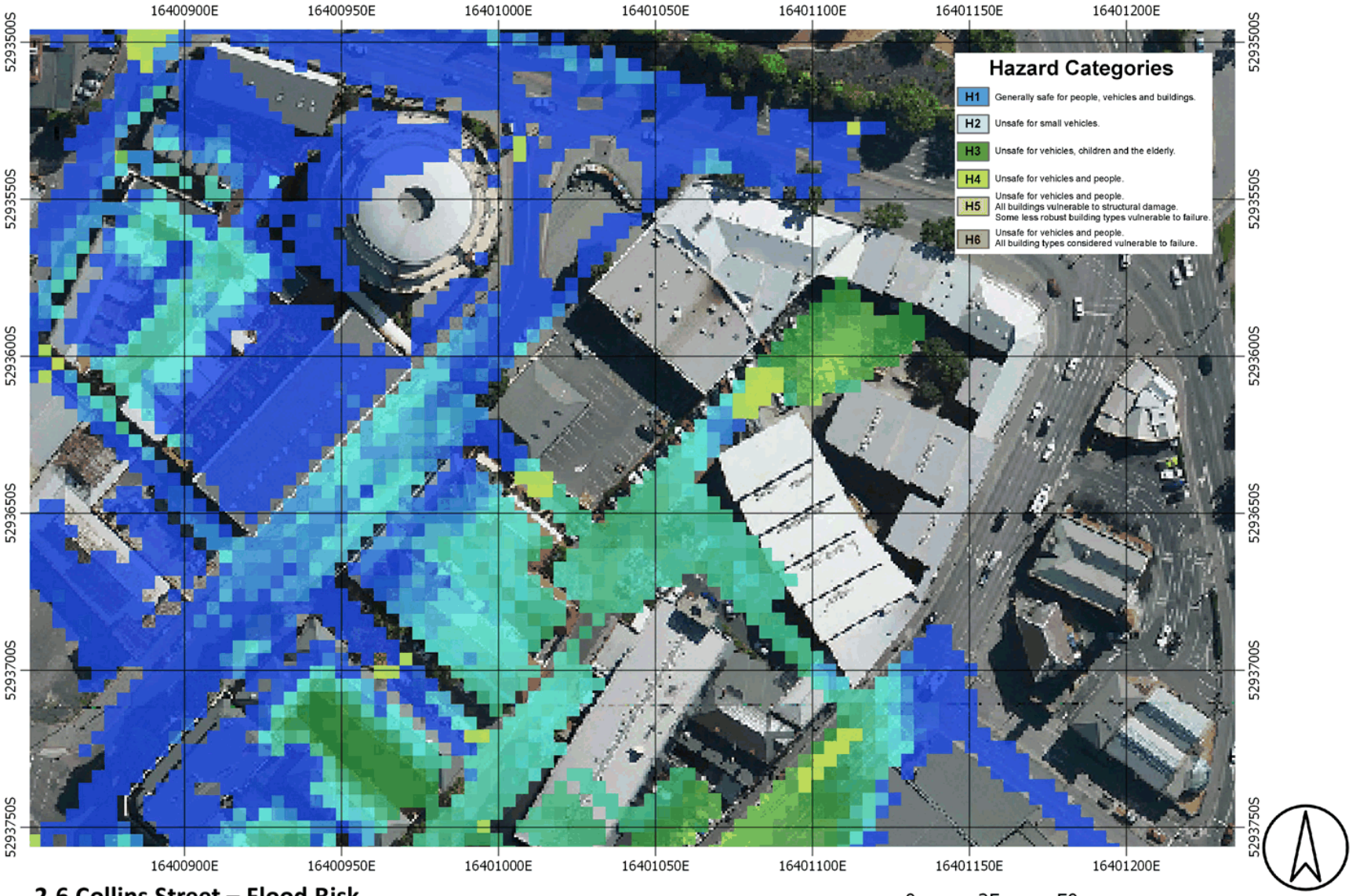

2-6 Collins Street – Flood Risk

Collins St Flood Hazard Map for a predicted 2100 climate with Frangrance developement

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GES

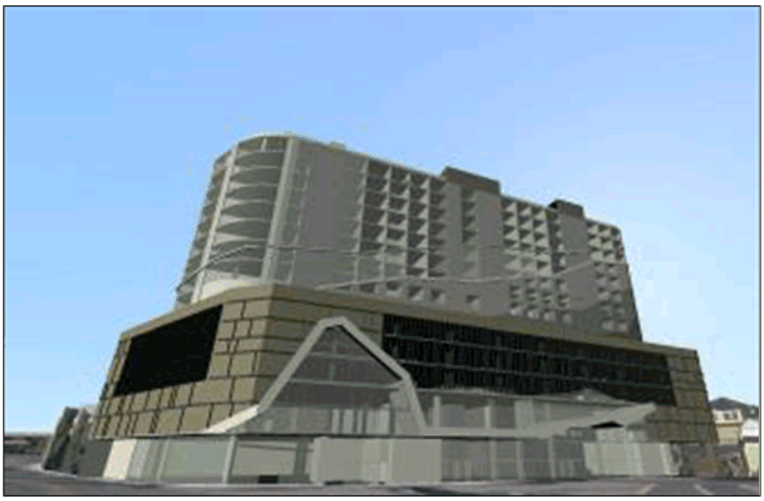
GEO-ENVIRONMENTAL

SOLUTIONS

CONTAMINATION MANAGEMENT PLAN – Version 5

2 COLLINS STREET, HOBART

31 JULY 2018



Geo-Environmental Solutions P/L 29 Kirksway Place, Battery Point 7004. Ph 6223 1839 Fax 6223 4539

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DOCUMENT CONTROL

Title	Version	Date	Author
Contamination Management Plan	Version 1	30 October 2017	Kris Taylor
Contamination Management Plan	Version 2	22 November 2017	Kris Taylor
Contamination Management Plan	Version 3	14 June 2018	Sarah Joyce
Contamination Management Plan	Version 4	3 July 2018	Sarah Joyce
Contamination Management Plan	Version 5	31 July 2018	Kris Taylor

1 Introduction

Geo-Environmental Solutions Pty. Ltd. (GES) of 29 Kirksway Place, Battery Point, Tasmania were engaged by Fragrance Group Ltd to prepare a site Contamination Management Plan (CMP) for 2 Collins St, Hobart - hereby referred to as 'The Site' (Figure 1). This document *Version 4* contains minor amendments from previous versions.

Given the level of contamination and need for an effective occupational health and safety plan, GES has recommended that a site Contamination Management Plan (CMP) is produced for the site (this document). This CMP has been prepared by a suitably qualified and experience practitioner in accordance with procedures and practices detailed in NEMP (2013) guidelines and key regulations and policies identified in the References section of this document. Personnel engaged in preparing this CMP are listed in Appendix 1 along with their relevant qualifications and years of experience.

Subject to the implementation of the requirements of the CMP, the land will be suitable for the approved used and the development will not adversely impact upon human health or the environment.

1.1 Background

GES completed an Environmental Site Assessment (ESA) report for the site March 2016, which was revised in July 2018 (version 6) which included a Tier 1 Health Risk Assessment (HRA) to assess any potential soil contamination risks which may arise due to proposed site building development works.

The ESA assessed the site based on commercial land use and concluded that providing this CMP document is implemented and followed, the proposed works are acceptable and will not adversely impact upon human health or the environment.

1.2 Objectives

The objective of this CMP was to comply with Hobart City Council planning requirements and the Sullivan's Cove Planning Scheme 1997. The purpose of this CMP is to identify the site hazards associated with soil contamination, minimise risks to site workers and the environment, and advise of safety measures to be adopted during and any future excavation or construction works that may occur at the site. If the principals are followed in this CMP then it is consideration of the Sullivan's Cove Planning Scheme 1997 will be met.

1.3 Scope of Works

The scope of work for the CMP is to produce a guidance document that includes information in relation to identifying measures and outlining procedures to minimise human health hazards and potential environmental impacts during all phases of site works including demolition, excavation and construction and/ or post construction future trench works at the site; which include:

- Minimisation of potential adverse environmental consequences associated with exposing contaminated soils and impacting ecological receptors (the nearby marine environment);
- Minimisation of potential health risks because of exposure to potentially contaminated soil around the site during excavation and demolition works as well as during storm events where contaminants may be mobilized from surface water runoff and erosion;
- Off-site soil disposal in accordance with IB105 guidelines; and
- Outline guidelines for decommissioning underground petrol storage systems

1.4 Responsibility of Implementation

It will be the responsibility of the owner(s) of the site to implement of this CMP. The owner(s) of the site may at times expressly delegate responsibility for site management as appropriate. The site owner(s) retains overall responsibility for implementation of this CMP and any modifications required should site conditions change.

The owner(s) of the site are responsible for the distribution of this CMP to any building or development contractors working on site and these contractors must also comply with the requirements of this CMP.

To manage potential health risks, the advice stipulated in this CMP should be followed by all persons involved in works or other activities at the site that may result in the disturbance and/or excavation of soil within the ESA investigation areas.

1.5 Site Details

Site details are presented in Table 1 and the site investigation areas are presented in Figure 1 & 2.

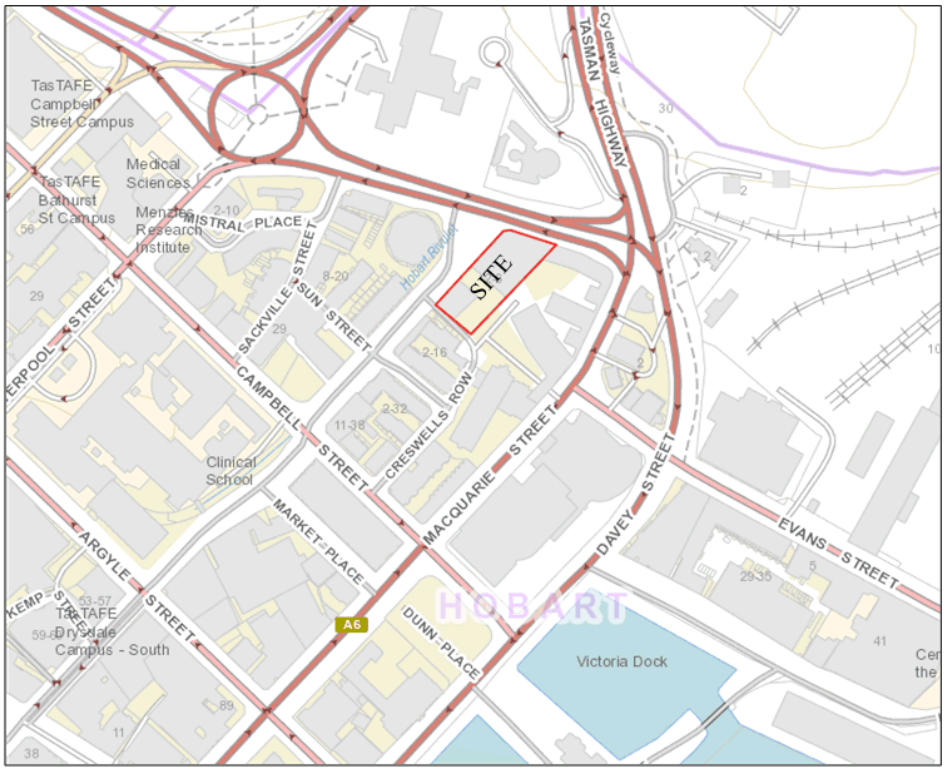


Figure 1-The LISTMap showing the location of the site

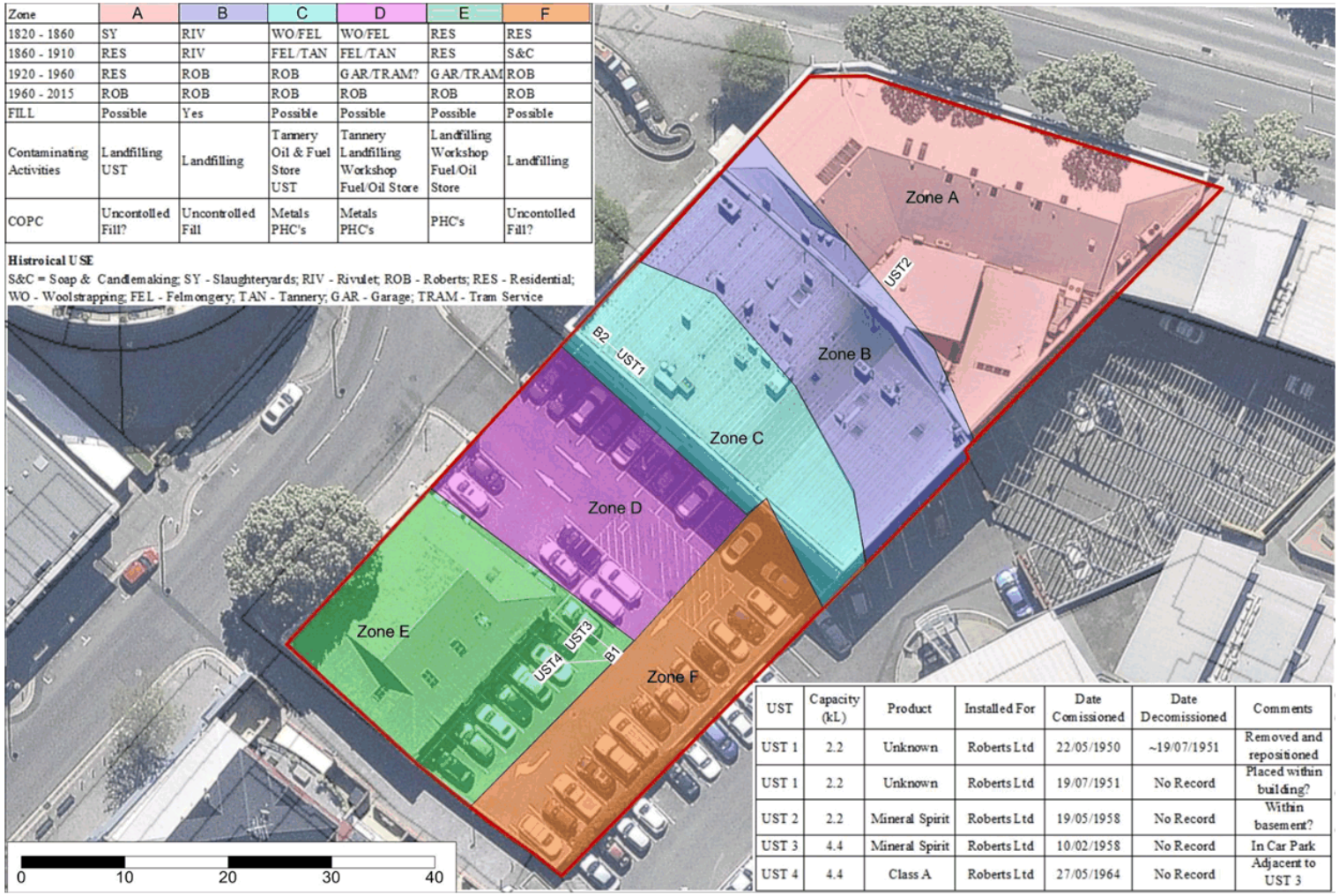
Table 1 Site Details

SITE LOCATION: 2 Collins Street, Hobart, Tasmania
APPROXIMATE SITE AREA 3009 m^2
TITLE REFERENCES CT 121603/1
SITE OWNER Fragrance TAS-HOBART (Collins) Pty Ltd
PREVIOUS LANDUSE 1920's to 1960's – Residential, Roberts & Garage/Tram service 1860's to 1910's – Residential, Fellmonger & Tannery & Hobart Town Rivulet 1820's to 1860's - Residential, , Fellmonger Wool-strapping Hobart Town Rivulet & Slaughter yards
SITE LAND USE Zoned '1.0 Inner City Residential(Wapping)' under the Sullivan's Cove Planning Zone The current land use is considered commercial based on current land usage.
PROPOSED LAND USE It is proposed that the site will consist of commercial office space and hotel accommodation.

SURROUNDING LAND USE: Zoned '1.0 Inner City Residential(Wapping)' under the Sullivan's Cove Planning Zone. A detailed assessment of historical surrounding land used was not conducted in the PESA. Existing surrounding land used includes residential and hotel accommodation and commercial office space
SITE COORDINATES MGA Zone 55: 527208 E 5252552 N

Zone	A	B	C	D	E	F
1820 - 1860	SY	RIV	WO/FEL	WO/FEL	RES	RES
1860 - 1910	RES	RIV	FEL/TAN	FEL/TAN	RES	S&C
1920 - 1960	RES	ROB	ROB	GAR/TRAM?	GAR/TRAM	ROB
1960 - 2015	ROB	ROB	ROB	ROB	ROB	ROB
FILL	Possible	Yes	Possible	Possible	Possible	Possible
Contaminating Activities	Landfilling UST	Landfilling	Tannery Oil & Fuel Store UST	Tannery Landfilling Workshop Fuel/Oil Store	Landfilling Workshop Fuel/Oil Store	Landfilling
COPC	Uncontolled Fill?	Uncontrolled Fill	Metals PHC's	Metals PHC's	PHC's	Uncontolled Fill?

Histroical USE
S&C = Soap & Candlemaking; SY - Slaughteryards; RIV - Rivulet; ROB - Roberts; RES - Residential; WO - Woolstrapping; FEL - Felmongery; TAN - Tannery; GAR - Garage; TRAM - Tram Service



UST	Capacity (kL)	Product	Installed For	Date Comissioned	Date Decomissioned	Comments
UST 1	2.2	Unknown	Roberts Ltd	22/05/1950	~19/07/1951	Removed and repositioned
UST 1	2.2	Unknown	Roberts Ltd	19/07/1951	No Record	Placed within building?
UST 2	2.2	Mineral Spirit	Roberts Ltd	19/05/1958	No Record	Within basement?
UST 3	4.4	Mineral Spirit	Roberts Ltd	10/02/1958	No Record	In Car Park
UST 4	4.4	Class A	Roberts Ltd	27/05/1964	No Record	Adjacent to UST 3

Figure 2 Aerial Photo Showing the Location of the Investigation Areas with Historical Site Potential Contamination Activities

2 Background Environmental Site Assessment Information

2.1 Soil Assessment Criteria

The reported soil analytical results were compared to the following relevant investigation guidelines suitable for assessment of soil contamination:

NEPM (2013) Schedule B1, Guideline on Investigation Levels for Soil.

- Health Investigation Limit (HIL D) – Commercial Land Use (assessing direct contact risk)
- Health Screening Limit (HSL D) – Commercial Land Use (assessing petroleum hydrocarbon vapour inhalation risk)
- Ecological Investigation Levels (EIL's) - have been developed for selected metal and organic substances in and commercial & industrial setting. Threshold limits are specific to select sample physical and chemical properties.
- Ecological Screening Levels (ESL's) - have been developed for organic petrochemical substances in commercial & industrial setting. Threshold limits are specific to select sample physical properties.

EPA Tasmania (2010) Information Bulletin 105 (IB105).

- Classification and Management of Contaminated Soil for Disposal, November 2010.

CRC CARE (2011)

- Health Screening Limit (HSL D) – Commercial Land Use (assessing petrochemical dermal contact risk in an industrial setting)

2.2 Soil Assessment Results

Soil samples were collected during borehole drilling works across the site as presented in Table 2 with locations presented in Figure 3.

Table 2 Summary of Soil Sampling

Hole ID	Soil Bore Drill & Sample
TH01 to TH06 & BH07	15/03/16
BH08 to BH13	16/03/16
BH14 to BH22	4/08/17

A total of 47 primary samples were collected from 22 locations across the site and submitted to a National Association of Testing Authorities (NATA) registered laboratory for analysis of identified contaminants of potential concern (COPC) which included the following:

- TPH/TRH;
- BTEX;
- PAHs
- Metals (15)

Please refer to Figure 4 which presents the areas of highest contamination. This figure should be used as a guide only as elevated levels of contamination may also be encountered elsewhere across the site.

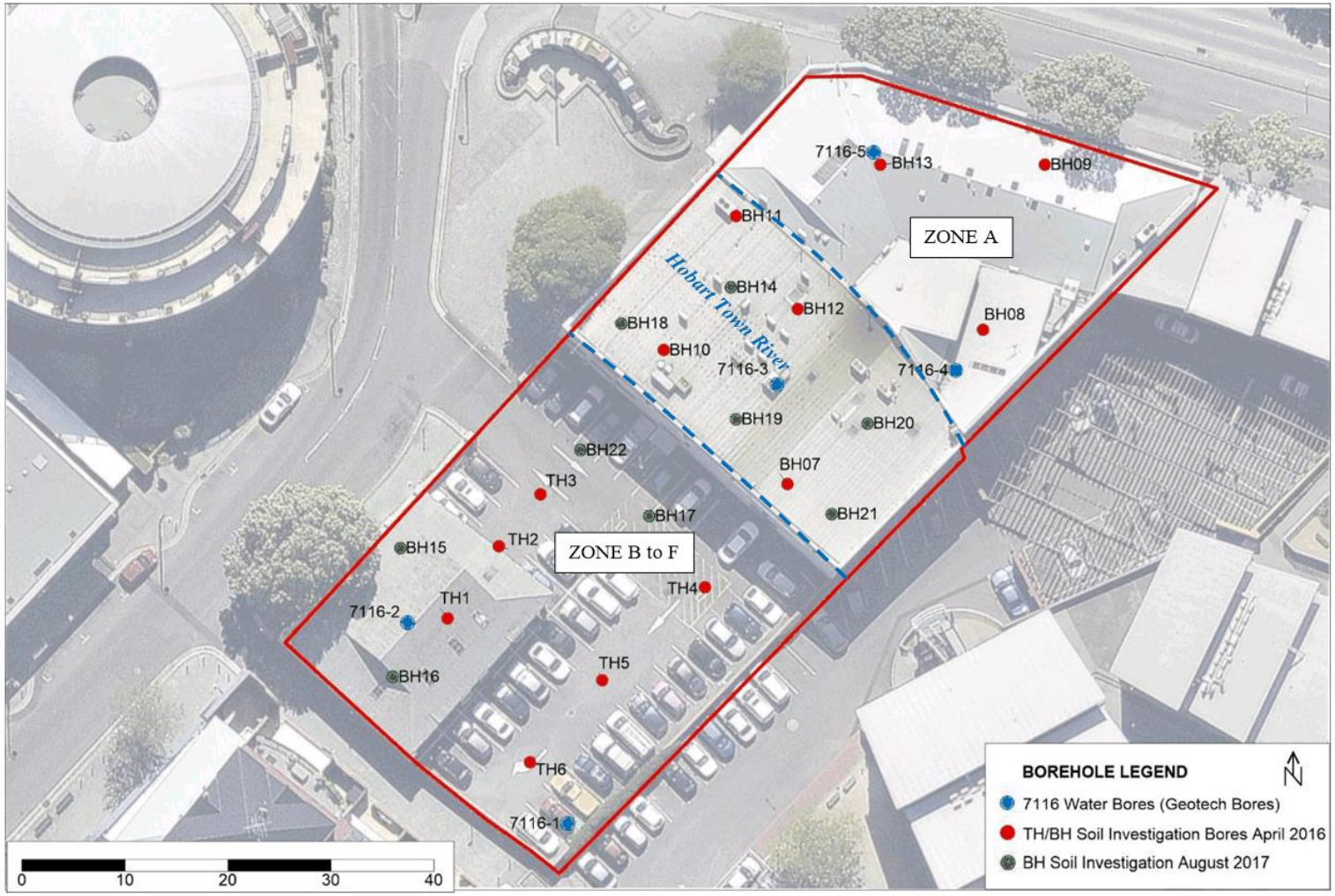


Figure 3 Borehole and Groundwater Monitoring Well locations

UST	Capacity (kL)	Product	Installed For	Date Comissioned	Date Decomissioned	Comments
UST 1	2.2	Unknown	Roberts Ltd	22/05/1950	~19/07/1951	Removed and repositioned
UST 1	2.2	Unknown	Roberts Ltd	19/07/1951	No Record	Placed within building?
UST 2	2.2	Mineral Spirit	Roberts Ltd	19/05/1958	No Record	Within basement?
UST 3	4.4	Mineral Spirit	Roberts Ltd	10/02/1958	No Record	In Car Park
UST 4	4.4	Class A	Roberts Ltd	27/05/1964	No Record	Adjacent to UST 3

Figure 4 Areas of Highest Contamination in red cross hatching, monitoring wells in 7116 #s.

2.2.1 Environmental

Ecological Screening Levels

Ecological screening levels (ESL) for commercial land use were exceeded in 27 (of the 47) samples collected at various depths from TH01, TH02, TH04, BH07, BH10, to BH12, BH14, BH15 to BH21. The primary ESL contaminant of concern is benzo(a)pyrene with minor F2 and F3 exceedances. ESL exceedances are in fill across most of the site (Zones B to F) and less apparent in Zone A.

Ecological Investigation Levels

Ecological investigation levels (ESL) for commercial land use were exceeded in 6 (of the 47) samples collected at various depths from TH04, BH07, & BH10 to BH12. The primary ESL contaminant of concern is zinc with minor naphthalene in BH10 which may be associated a historical kerosene or diesel spill near UST1 (Figure 2).

Environmental Risks

Based on the proposed land-use and layout, the Tier 1 ESA concluded the following with respect to environmental risks:

- Zinc concentrations are deemed as acceptable in the context of the environmental setting given the common occurrence of zinc in most residential and commercial settings where there has been galvanized iron roofing and other structures, which have corroded over time; and
- Given benzo(a)pyrene is present in relatively high concentrations at the site, measures will need to be put in place to minimize likelihood of leaching into the underlying aquifer.

Once pavement is removed from the site, environmental impact of marine waters may occur because of the release of PAH's and heavy metals from leaching of contaminated fill material. Where possible, this will need to be managed as will excavated fill material to ensure that it is not washed into stormwater culverts and the marine environment.

Mitigation measures relating to the identified risks are detailed in Section 5.

2.2.2 Human Health

Health Investigation Levels

Health investigation levels (HIL) for commercial land use were exceeded in 6 (of the 47) samples collected at various depths from TH01, BH07, BH10 & BH18. The primary HIL contaminant of concern is benzo(a)pyrene with single lead exceedance in BH18. HIL exceedances are primarily in fill dumped on the southern embankment of historical Hobart Town River (Figure 3). An isolated occurrence (in TH01) was identified in the historical tram service/garage area (Figure 2).

Health Screening Levels

There were no identified commercial land use HSL exceedances for assessing dermal contact and vapour intrusion risk to both trench workers and indoor vapour intrusion.

Human Health Risks

Based on the proposed land-use and layout, the Tier 1 ESA concluded the following with respect to human health risks:

- Lead and benzo(a)pyrene impact detected in fill on the southern side of the former rivulet as well as beneath the former workshop and train service area may pose an unacceptable ingestion or dust inhalation health risk to commercial workers unless the material is suitably covered and protected from future exposure. There is a possibility this may be present in high connections at other locations across the site and general precautions are necessary for site workers.

Mitigation measures relating to the identified risks are detailed in Section 5.

2.3 Water Assessment Criteria

Groundwater samples at the site were assessed against the following relevant investigation guidelines suitable for assessment of water contamination:

Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC) 2000

Guidelines for 90% protection of marine water ecosystems

Taswater guidelines for offsite wastewater disposal

2.4 Groundwater Assessment Results

The localised receptor is expected to be Victoria Dock which is located at the exit point of the previous onsite stream. There is the possibility that groundwater may migrate towards the new Hobart Rivulet alignment.

Metal concentrations in groundwater were exceeded in groundwater collected during the March 2016 event in the following wells:

- Copper: 7116-04 & 7116-05;
- Zinc: 7116-04 & 7116-05; and
- Mercury: 7116-01 & 7116-04.

Metal concentrations in groundwater were exceeded in groundwater collected during the August 2017 event in the following wells:

- Copper: 7116-03, 7116-04 &7116-05 which are right on the investigation limit of 0.003 ug/L;
- A single isolated occurrence of vanadium in 7116-04.

It is likely that impacted groundwater may originate from upgradient of the site.

2.5 Surface Water Assessment Guidelines

Of most concern is once the pavement has been removed the potential for surface waters collecting on the site to become impacted by identified soil contamination beneath the existing pavement surface. All surface water collecting onsite needs to be treated as contaminated and a preliminary assumption needs to be made that the surface water exceeds ANZECC 2000 guidelines for 90% protection of marine water ecosystems. Until prove otherwise, the water is to be collected onsite and managed accordingly.

3 Stages of Work

The relevant sections of the CMP should be referred to during the following phases of site work: prior to commencement demolition, excavation, construction and ongoing future trenchwork at the site.

3.1 Prior to Commencement

Contractors and workers must be made aware of the potential soil contamination and be familiar with the requirements of the CMP and they should also know that there may be environmental or human health consequences that result from noncompliance which may encore a fine from the EPA Tasmania.

Contractors must prepare one or more of the following: a site-specific Health and Safety Plan, a Job Safety Analysis (JSA) or a Safe Work Methods Statement (SWMS) covering their workers at the site for any reasonably anticipated risks.

3.2 Demolition

Demolition site work will involve the demolition of all site buildings, decommissioning redundant service infrastructure and removing all site surface coverings. Asbestos may be present in the site buildings, this is beyond the scope of the ESA or this CMP.

There will be former below ground infrastructure and associated fuel lines that require removal. See Figure 2 for the location of the underground petroleum storage systems (UPSS). Please refer to section 7 Tank Decommissioning for the details of removing the UPSS.

It should be noted that asphalt surfaces often have hydrocarbon contamination, so any asphalt surface material should be managed separately to other materials.

3.3 Soil and Water Management

A soil and water management plan should be put in place which closely aligned with aspects identified within this section of the contamination management plan.

The time between site demolition and site resurfacing (placement of the ground floor slab) is a period where there is a heightened risk of offsite spread of hydrocarbon and heavy metal impact. This period is expected to last through potentially dry and heavy rainfall events, and delays may be expected because of archeological digging. During this time there is expected to be the greatest chance of offsite spread of contaminates through leaching and soil erosion from vehicle & foot traffic, surface water riling, and dust generation.

The post demolition surface will range in elevation from 3.3 to 3.7 m AHD, with a deep depression on the eastern side of the site to ~2.7 m AHD towards the Woolstore Accommodation carpark. Much surface water at the site is expected to drain towards this point. This is particularly the case given much of the underlying surface of the site comprises of clay and there is therefore a low chance of percolation. If unmanaged, potentially impacted surface water and soil will drain into the neighboring Woolstore carpark.

This will continue to occur after the surface of the site is backfilled with aggregate, and measures introduced in the initial post demolition stage will need to continue until the site has finally been paved.

It is recommended that a drainage sump is placed at the site to collect surface water. The best location for this sump may be the lower lying section of the site on the eastern boundary. Perimeter drains should be set up to divert water into the sump and the prevent offsite discharge of impacted water. The sump should have additional pumps set up as backup which discharge water into onsite holding tanks of adequate size to allow for survivability (cartage) after a heavy downpour.

The sump should remain in place following placement of fill given surface water will continue to percolate and discharge into the sump and towards the neighboring site. The sump can be finally decommissioned following surfacing of the site.

It is highly recommended that bitumen removal occurs at the last stage of site demolition (following all excavation works). This will allow a hardstand area for vehicles to park which will reduce offsite spread of contaminants.

Open site drains should be converted to French drains with ag piping and geotextile (if not already done) and the sump should remain active until slab formwork is ready to be installed.

In summary, rainfall events may cause a spike in site contaminant concentration in surface waters passing over the site. This may be managed by:

- Appropriate personal protective equipment and processes are required when handling potentially contaminated water.
- limiting the exposure of paved surfaces through keeping pavement in place for as long as possible.
- Limiting the length of time, the service trenches and footing trenches remain open;
- Careful management of the site topsoil to reduce the risk of soil erosion and overland movement of impacted soil and water into drainage systems.
- Placing cutoff drains around the perimeter of the site and collecting all runoff into a suitably sized sump.
- Water that is encountered at the site, through pumping or extracting and is required to be removed needs to be contained at the site so as not to cause environmental harm.
- Sump pumps (of suitable size) should be used to discharge sump water into dedicated holding tanks of suitable size provided by a registered waste contractor which fit with the collection schedule and site stormwater flow calculations;
- Off-site disposal of wastewater must be conducted in accordance with the Environmental Management and Pollution Control (Waste Management) Regulations, 2000 and local Water Authority (TasWater) requirements.
- Testing and assessment of the quality of the extracted water must be conducted prior to disposal. A suitably qualified environmental consultant should conduct sampling and analysis to advise on appropriate management options.
- Sump water should be analysed immediately following minor rainfall events rather than risking full tanks before testing. As a guide, a testing turnaround time of 3 days is typical during working days (5 days either side of a weekend).
- Dependent on the results of analysis the liquid waste will typically be disposed to a licensed waste treatment facility
- Alternatively, the water must be transported to an approved facility for offsite remediation by a Controlled Waste Handler approved by EPA Tasmania.

3.4 Excavation

The proposed final floor level will be at 4.60m AHD which is approximately 1m above the current site level and approximately 1m of fill be required, give or take, across the entire site. Excavations are expected to be minimal and will be required for services, the building footings and lift wells only. Appropriate soil disposal associated with the development will be required. Excavation works as part of the development is anticipated to include:

- Levelling of the site;
- Installation of underground infrastructure such as pipes for water/ storm water and cables for electricity;
- Excavations/ drilling for the new buildings deep footings; and
- Shallow excavations for the cavity for the six lift wells and stair cases.

During excavation work, soil from the site must be managed so as not to cause environmental harm in accordance with the Environmental Management and Pollution Control (Waste Management) Regulations, 2000 and the Environmental Management and Pollution Control Act (EMPCA, 1994). Harm can be caused from contaminated soils leaching further underground, leaving the site through wind (as dust) or carried off site with rain (as runoff storm water). See Section 4 for the Minimisation of Potential Environmental Impacts. Although the management of excavated material will be limited, the following should be considered when managing soil at the site:

- It must be managed vertically as well as area specific due to surface and localised areas of contamination across the site. *It is noted that soil in the upper 1 m of the site should be considered contaminated. It is advised that this upper metre excavated out of boreholes or excavations is not mixed with soil or rock from a greater depth at this will likely contaminate all material, and subsequently all material may need to be transported offsite to a licenced facility. Surface metre of soil should be stockpiled separately.*
- If stockpiled for greater than 12 hours should be covered with an impermeable layer (eg. PVC plastic 2mm thick) to prevent the contents being affected by wind or rain;
- Soil which will excavated and removed from the site for landfill disposal is to be assessed by an Environmental Consultant and results compared against Information Bulletin 105 (IB105) for Classification and Management of Contaminated Soil for Disposal. See Section 6 IB 105.
- It is not necessary for the soil that remains on site to be classified against IB 105.

3.5 Construction

If there are any changes to the plans during the construction phase and additional excavations are required, the CMP should be revisited.

3.6 Future Trench Work

It is anticipated that over time future trench workers/ contractors will visit the site from time to time as services require repairs or new infrastructure is required. These trench workers/ contractors should be made aware of the potential contamination that may be encountered at the site and should be provided with a copy of this document.

4 Minimisation of Potential Environmental Impacts

The potential adverse environmental consequences associated with exposing contaminated soils and impacting ecological receptors (the nearby marine environment) includes:

- Leaching of metals and PAHs from contaminated soils into groundwater; and/ or
- The movement of contaminated soil into the stormwater system.

To minimise potential migration of contaminants into the marine environment, all work carried out prior to, during and following the completion of any soil excavation, must be conducted in accordance with the guidance set out in this plan as well as all relevant EPA Tasmania guidelines.

4.1 During Excavation Works

During excavation works excavated soil must be:

- Managed vertically as well as specific areas due to surface and localised areas of contamination across the site, see Figure 4.
- If stockpiled for greater than 12 hours should be covered with an impermeable layer (eg. PVC plastic 2mm thick) to prevent the contents being affected by wind or rain;
- If soil is going to be removed from site is to be assessed and sampled by an Environmental Consultant and results compared against *Information Bulletin 105 (IB105) for Classification and Management of Contaminated Soil for Disposal.*

It is not necessary for the soil that remains on site to be classified against IB 105.

4.2 Stormwater Management and Sediment Control

To prevent contaminated soil leaving the site and potentially contaminating groundwater and storm water the following measures should be followed:

- Install drainage and/or grade soil surfaces to minimise pooling of water on exposed soils.
- Place sediment control devices around storm water drains and stockpiles as required.
- Ensure vehicles and equipment are free from excess soil when leaving the site, to avoid tracking soil off-site.
- Establish an equipment wash down area if necessary.
- Keep stockpiles covered and sealed at all times possible
- Avoid extended stockpiling of soil.
- Clean up any soil spilt on roads adjoining the site.
- Avoid conducting vehicle or machinery maintenance on-site.
- Ensure any fuel, oil or other chemicals are stored safely and securely and are prevented from leaking.
- Repair or remove any leaking containers or machinery from the site.
- Clean up any spilt fuel, oil or other chemicals as soon as possible.
- Check sediment control measures regularly (at least daily) and clean and maintain as necessary.
- Inspect sediment control measures more frequently during rain periods, to check they are adequate for site conditions.

4.3 Dust Control for Environmental Protection

Generation of dust can spread contaminated soil causing environmental harm or create a nuisance to neighbouring residents causing adverse health effects. Measures that can be undertaken to assist in minimising the generation of dust which will minimised the amount of soil leaving the site include:

- Minimise movement of equipment on the site.
- Minimise excavation and movement of soils.
- Use a water spray to dampen work areas sparingly if excess dust is generated.
- Use a water spray sparingly to dampen soil prior to and during excavation if excess dust is generated.
- Avoid soil excavations that create dust on windy days.
- Keep soil stockpiles covered at all times possible, with an impermeable membrane (eg. plastic sheeting) to minimise generation of dust and to limit runoff of sediment.

- Avoid extended stockpiling of soil.
- Consider the use of dust barriers such as hessian or cloth screening.

4.4 Surface Covering

An impermeable barrier can act as physical cap that ensures onsite soil contamination does not come in contact with ecosystem receptors and/ or human receptors. Physical separation layers are applicable to areas where there is soil excavation and/or surface cover disturbance at the site which includes infilling and stockpiling. In the areas of the site not covered by a permanent hardstand surface (such as bitumen, concrete or building slabs) capping measures for the various landscaping finishes are required to prevent contact with the underlying soil as a precautionary measure. Some relevant examples of suitable capping layers are described in Table 3 below. These options may also be used as a short term solution.

Table 3 Examples of Capping Layers

Surface Landscape Type	Area/Land Use	Characteristic	Capping Requirements
Concrete	Footpaths and high wear areas	High traffic areas	Suitable in a range of areas due to the ability to provide a level surface. Provides effective barrier to underlying soils and is not likely to leach contaminants.
Bitumen	Access roads	High traffic areas	Keep existing bitumen surfaces if possible. Newly reinstated bitumen in accordance with roads standards.

5 Minimisation of Potential Health Risks

5.1 Human Health Exposure Routes

Potential health exposure risks during any excavations or subsurface works may be associated with soil excavation and management, movement of soil around the site and/ or storm water management and sedimentation. Onsite exposure pathways include dermal contact, ingestion of contaminated soil and surface water and inhalation of dust. The most likely hazard scenario for offsite human receptors include dust inhalation and soil ingestion.

A soil and water management plan will need to be put in place to minimize offsite erosion and drainage of hydrocarbon and heavy metal impacted surface water. Offsite residential receptors have a higher exposure risk compared with onsite commercial receptors.

To minimise potential human health risks, all work must be conducted in accordance with the guidance set out in this plan as well as any relevant EPA Tasmania guidelines.

Work procedures conducted on the site must be in accordance with relevant Occupational Health and Safety (OH&S) Regulations. It is the responsibility of the principal contractor that site workers are made aware of the OH&S issues at the site.

Engaged companies/contractors must prepare one or more of the following a site-specific Health and Safety Plan, a job safety analysis (JSA) or a safe work methods statement (SWMS) covering their workers at the site for any anticipated risks.

5.2 Mandatory Site Inductions

The principal contractor must ensure that site workers and visitors are provided with:

- Site safety induction briefing.
- Adequate hand washing facilities.
- A designated clean area for storage and consumption of food and drink.

Personnel working at or visiting the site during site redevelopment, including demolition, excavation, construction and future trench work, must be provided with an induction briefing, based on the example *Site Induction Record* provided in Appendix 2. This induction record may be incorporated into the general site induction procedure if the site operator does not have their own or if it does not sufficiently cover the issue of contamination management. The principal contractor may delegate responsibility for the induction briefing to environmental consultants

5.2.1 Limiting Soil Contamination Exposure

Measures that must be undertaken to manage exposure of site workers to contaminated soil include:

- Avoid handling of potentially contaminated soil and/or water.
- Wash hands before eating, drinking or smoking.
- Avoid activities that may introduce soil and/or water to the mouth, such as nail biting.
- Remove soiled clothing and footwear before entering a designated clean area and before leaving the site.
- Use personal protective equipment (PPE) as required. In addition to hard hats, safety boots, safety glasses and hearing protection, this equipment may include:
    - Gloves;
    - Long sleeved shirt and long trousers; and
    - As applicable dust masks.

5.2.2 Limiting Dust Exposure

Generation of dust can spread contaminated soil and pose a risk to human health risk onsite and offsite. Measures that can be undertaken to assist in minimising the generation of dust and limit the amount of soil leaving the site include:

- Minimise movement of equipment on the site.
- Minimise excavation and movement of soils.
- Use a water spray sparingly to dampen work areas if excess dust is generated.

- Use a water spray sparingly to dampen soil prior to and during excavation if excess dust is generated.
- Avoid soil excavations that create dust on windy days.
- Keep soil stockpiles covered at all times possible, with an impermeable membrane (eg. plastic sheeting) to minimise generation of dust and to limit runoff of sediment.
- Avoid extended stockpiling of soil.
- Consider the use of dust barriers such as hessian or cloth screening.

5.2.3 Surface Covering

An impermeable barrier can act as physical cap that ensures onsite users and offsite users do not meet potentially contaminated soil. All soil stockpiles should be covered, and any discernable offsite soil erosion should similarly be covered. Refer to Section 4.4 Surface Covering for details.

5.2.4 Monitoring Soil Gas Exposure

Measures that must be undertaken to manage exposure of site workers (during excavation, construction and future trench workers) to soil gas contaminants include:

- Anecdotical evidence suggest that cyanide gasses as well as petroleum hydrocarbons may be present at the site.
- Standard OS&S procedures should be followed for working in confined spaces; and
- Personal gas monitoring devices such as an LEL meter should be used prior to and at all times while in confined spaces.

6 IB 105 Guidelines

Given the historical use of the site and variation in soil classification and contamination across the site, GES recommends that all soil excavated at the site is stockpiled systematically, tested for contamination levels and transported to a licensed storage and handling facility for managing contaminated soil.

Soil flagged for landfill disposal is to be assessed by an Environmental Consultant and results compared against *Information Bulletin 105 (IB105) for Classification and Management of Contaminated Soil for Disposal.*

See Appendix 3 for the comparison of soil analytical results from the ESA against IB105 plus IB105 in full. It is anticipated heavy metal and PAH contamination will be encountered across the site.

Crushed rock should be kept separate to the fill material, this will minimise disposal costs of contaminated material.

7 Tank Decommissioning

The following should be undertaken during the process of Underground Tank decommissioning and removal:

- A suitable qualified and experience contractor should be engaged to the remove the Underground Petroleum Storage Systems (UPSS) and/ or underground storage tanks (USTs) and the Environmental Consultant should be onsite during the excavation to observe the material that is being removed from each tank pit, sample and document to produce a site validation report.
- The storage system must be removed and disposed of in accordance with *Australian Standard AS 4976 The removal and disposal of underground petroleum storage tanks (AS4976).*
- The decommissioning of UPSS and USTs must be done in accordance with the EPA Tasmania Technical Guideline UPSS2 *'Underground Petroleum Storage Systems: Decommissioning Assessment – Sampling and Risk Assessment Guidelines.* A copy of these guidelines should be followed by the environmental consultant and communicated with staff on the ground.
- A *UPSS Decommissioned UPSS Form* must be completed and submitted to the EPA Tasmania once the tank has been removed.
- The validation report must be produced in accordance with EPA Tasmania Technical Guideline UPSS1 *'Underground Petroleum Storage Systems: Decommissioning Assessment – Report*

Requirements'. This document must be submitted to the EPA Tasmania within 4 months of removal.

At a minimum the following procedures should be followed during the tank decommissioning:

- Photographs documenting the tank removals should be taken.
- The removed tanks and infrastructure should be inspected for leaks.
- The tank pit should be open for as little time possible and covered with plastic while open overnight with suitable OH&S barriers.
- Tank pit walls and base plus any groundwater in the excavation should be screened and sampled by the environmental consultant.
- No soil or groundwater derived from the tank pit is to be removed from site from the unless inspected, screened and sampled by Environmental consultant.
- Hot works should not be conducted near the tank pits while removal is taking place or while the hole remains open.

8 SUMMARY OF ROLES AND RESPONSIBILITY

Site Owner	The owner(s) of the site are responsible for the distribution of this CMP to any building or development contractors working on site and these contractors must also comply with the requirements of this CMP. There is a responsibility to ensure a soil and water management plan (SWMP) is put in place prior to site demolition works, and the plan is active as soon as site coverings are removed. The SWMP should not be removed until site ground floor slab formwork is being prepared. Post the site redevelopment, the site owner(s), who may delegate to a site operator is responsible and must inform future site contractors and trench workers of the CMP and the requirements to follow its contents.
Site Manager during site redevelopment	Responsible for the preliminary assessment of potential contamination discovered and assessing whether further action is required. The Site Manager is responsible for ensuring the induction of Site Operatives, assessing the adequacy of quarantine measures and contacting the relevant Consultant and/or Contractors where appropriate. Potential offsite migration of surface water and soil needs to be assessed during and after rain events. Once an area is declared free of the contamination, the Site Manager's role will be to remove the quarantine and allow site works to proceed
Site Operatives	During the works, the Site Operative will be vigilant for potential contamination. Where potential contamination is identified, Site Operatives will quarantine the area and inform the Site Manager. An Environmental Consultant may be required to assess the site. Potential offsite migration of surface water and soil needs to be assessed during and after rain events.
Environmental Consultant	If the services of an Environmental Consultant is required, (as they will be for the tank pit sampling and validation report writing) they will be responsible for assessing the potential contamination find, undertaking any necessary sampling and delineation, if required, developing a remedial scope and validating remediation to render the site suitable for residential development. The Environmental Consultant must have appropriate qualifications and expertise in environmental assessment (e.g. an experienced environmental scientist, environmental soil scientist, environmental geologist or environmental engineer). All findings and conclusions will be reported, as appropriate, to the satisfaction of the Site Manager and the Site Owner

LIMITATIONS STATEMENT

This Contamination Management Plan has been prepared in accordance with the scope of services between Geo-Environmental Solutions Pty. Ltd. (GES) and Fragrance TAS – HOBART (Collins) Pty Ltd ('the Client'). To the best of GES's knowledge, the information presented herein represents the Client's requirements at the time of printing of the Report. However, the passage of time, manifestation of latent conditions or impacts of future events may result in findings differing from that described in this Report. In preparing this Report, GES has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations referenced herein. Except as otherwise stated in this Report, GES has not verified the accuracy or completeness of such data, surveys, analyses, designs, plans and other information.

The scope of this study does not allow for the review of every possible soil and groundwater contaminant over the whole area of the site. The conclusions described within this report are based on these samples, the results of their analysis from the Environmental Site Assessment by GES (June, 2018) and an assessment of their contamination status.

This report does not purport to provide legal advice. Readers of the report should engage professional legal practitioners for this purpose as required.

No responsibility is accepted for use of any part of this report in any other context or for any other purpose by third party.

REFERENCES

ADWG (2011) – National Health and Medical Research Council / National Resource Management Ministerial Council (NHMRC / NRMMC) – Australian Drinking Water Guidelines.

ANZECC (1992) – Australian and New Zealand Environment & Conservation Council – National Water Quality Management Strategy. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

ANZECC (2000) – Australian and New Zealand Environment & Conservation Council – National Water Quality Management Strategy. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Australian Standard: AS 4482.1-2005 Guide to the investigation and sampling of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds

Australian Standard: AS 4482.2-1999 Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances

CRC CARE (2011) – Technical Report No. 10 – Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, September 2010. Friebel, E., Nadebaum, P. & GHD Pty Ltd.

DPIWE (1997) – State Policy on Water Quality Management, 1997.

Environmental Management and Pollution Control (Waste Management) Regulations 2000.

Environmental Management and Pollution Control Act (1994).

GES 2018. Environmental Site Assessment Version 6. 2 Collins Street, Hobart. Fragrance Group Ltd. July 2018.

Hobart City Council, 1997, 'Sullivans Cove Planning Scheme 1997'

Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (November 2010), EPA Tasmania.

NEPM (2013) National Environment Protection (Assessment of Site Contamination) Measure, 1999 as amended 2013.

APPENDIX 1 GES STAFF

Geo-Environmental Solutions (GES) is a specialist geotechnical and environmental consultancy providing advice on all aspects of soils, geology, hydrology, and soil and groundwater contamination across a diverse range of industries.

Geo Environmental Solutions Pty Ltd:

- ACN – 115 004 834
- ABN – 24 115 004 834

GES STAFF - ENGAGED IN SITE INVESTIGATION WORKS

Dr John Paul Cumming B.Agr.Sc (Hons) Phd CPSS GAICD

- Principle Author and Principle Environmental Consultant
- PhD in Environmental Soil Chemistry from the University of Tasmania in 2007
- 12 years' experience in environmental contamination assessment and site remediation.

Mr Kris Taylor Bsc (Hons)

- Senior Environmental & Engineering Geologist
- Honours in Environmental Geology at the University of Tasmania in 1998
- 15 years' experience in environmental contamination assessments and hydrogeology (including honours in mine site tailing pollution assessment)

Ms Sarah Joyce BSc (Hons)

- Senior Environmental Scientist
- Honours in Geography and Environmental Science at the University of Tasmania in 2003;
- Undergraduate Degree Double Major in Geology and Geography & Environmental Science
- 15 years professional work experience and six years contaminated site assessment

Mr Grant McDonald (Adv. cert. hort.)

- Soil Technician
- 6 years' experience in hydrocarbon and heavy metal contamination sampling of soils and groundwater.

Mr Aaron Plummer(Cert. IV)

- Soil Technician
- 3 years' experience in hydrocarbon and heavy metal contamination sampling of soils and groundwater.

GES STAFF – CONTAMINATED SITES EXPERIENCE

Mr Sam Rees B.Agr.Sc (Phd)

- Soil & Environmental Scientist
- 6 years' experience in hydrocarbon and heavy metal contamination assessment and reporting of soils and groundwater.

Mr Mark Downie B.Agr.Sc (Hons)

- Soil Scientist
- 3 Year experience in contamination assessment and reporting of soils and groundwater.

Mr Matthew Temlett

- Engineering Geologist
- Masters in Applied Environmental Geology
- 10 years working as an Engineer and two years experience in contaminated sites; soil, groundwater and conceptual site models.

APPENDIX 2 Site Induction Form

2 Collins St, Hobart, Tasmania

I …… of …… have been inducted to 2 Collins Street St, Hobart, Tasmania and have been informed of the CMP and its contents on ……..(date)

I have been informed of the contents of the CMP and the responsibilities I have in ensuring that the CMP is adhered to relating to the following issues:

- Understanding the site contamination status
- Understanding the potential health impacts for site workers associated with site contamination
- Understanding the potential environmental impacts associated with site contamination
- Understanding how to reduce the risks to human health and the environment
- Maintaining documentation related to upholding the CMP

SOIL MANAGEMENT

- Excavation and stockpiling of soil at the site
- Movement of soil around the site
- Off-site disposal of soil
- Import of fill to the site
- Dust control

WATER MANAGEMENT

- • Stormwater management and sediment control

I HEREBY ACCEPT THESE RESPONSIBILITIES.

NAME: ……COMPANY:……

SIGNED ……DATE ……

INDUCTED BY: ……DATE ……

APPENDIX 3 IB 105

IB105 is on the next page. The soil samples have been compared against IB105 guidelines for soil disposal, refer to Table 4. The following conclusions have been made;

- Exceedances of barium, cadmium, copper, lead, manganese, mercury and zinc have been detected up to Level 2 however when these metal concentrations are averaged the soil is reduced to level 1 classification.
- Exceedances of lead have been detected up to Level 3 however when these metal concentrations are averaged the soil is reduced to level 1 classification.
- Exceedances of B(a)p, and the Sum of PAHs have been detected up to Level 4 however when these analyte concentrations are averaged the soil is reduced to level 3 classification.
- Exceedances of TRH (C^{10}-C^{36}) have been detected to Level 3 however when these metal concentrations are averaged the soil is reduced to level 2 classification.

Table 4 Soil Analytical Results Compared Against IB105 Investigation Limits for soil Disposal, March 2016 and August 2017

Information Bulletin 105 Classification and Management of Contaminated Soil For Disposal		EG005T: Total Metals by ICP-AES											EG035T: Total Recc			EP080: BTEX					EP080/071: TRH		
		Arsenic	Barium	Beryllium	Cadmium	Chromium Total	Cobalt	Copper	Lead	Manganese	Nickel	Zinc	Mercury	Benzo(a)pyrene	Sum of polycyclic aromatic hydrocarbons	Benzene	Toluene	Ethylbenzene	Total Xylenes	C6 - C9 Fraction	C10 - C36 Fraction (sum)
Unit		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR		5	10	1	1	2	2	5	5	5	2	5	0.1	0.5	0.5	0.2	0.5	0.5	0.5	10	50
Investigation Level Selected																					
IB105 Level 1		20	300	2	3	50	100	100	300	500	60	200	1	0.08	20	1	1	3	14	65	1000
IB105 Level 2		200	3000	40	40	500	200	2000	1200	5000	600	14000	30	2	40	5	100	100	180	650	5000
IB105 Level 3		750	30000	400	400	5000	1000	7500	3000	25000	3000	50000	110	20	200	50	1000	1080	1800	1000	10000
IB105 Level 4		>750	>30000	>400	>400	>5000	>1000	>7500	>3000	>25000	>3000	>50000	>110	>20	>200	>50	>1000	>1080	>1800	>1000	>10000
4/08/2017	BH14 0.5-0.6	12	120	<1	<1	17	17	92	227	373	23	146	0.6	22.2	268	<0.2	<0.5	<0.5	<0.5	<10	1830
4/08/2017	BH14 2.5-2.6	<5	<10	<1	<1	5	10	6	12	135	9	26	<0.1	<0.5	1.3	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH15 0.5-0.6	<5	90	<1	<1	12	16	109	125	279	16	99	0.2	21	217	<0.2	<0.5	<0.5	<0.5	<10	1300
4/08/2017	BH15 2.5-2.6	<5	70	<1	<1	9	9	44	126	245	8	44	1.1	0.7	7.1	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH16 0.5-0.6	<5	130	<1	<1	12	19	73	192	326	15	157	1.6	27	354	<0.2	<0.5	<0.5	<0.5	<10	1910
4/08/2017	BH16 2.5-2.6	<5	80	<1	<1	8	8	24	91	153	8	23	0.2	2.6	40.9	<0.2	<0.5	<0.5	<0.5	<10	120
4/08/2017	BH17 0.5-0.6	<5	80	<1	2	5	7	78	1270	277	8	527	0.2	24.6	178	<0.2	<0.5	<0.5	<0.5	<10	3730
4/08/2017	BH17 2.5-2.6	<5	60	<1	<1	9	8	38	46	237	8	23	0.6	0.8	19.3	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH18 0.5-0.6	<5	80	<1	3	10	15	62	1600	434	13	314	0.3	30.4	407	<0.2	<0.5	<0.5	<0.5	<10	2190
4/08/2017	BH18 2.1-2.2	<5	30	<1	<1	9	15	15	45	160	12	75	0.1	2.3	40.6	<0.2	<0.5	<0.5	<0.5	<10	140
4/08/2017	BH19 0.5-0.6	7	180	<1	<1	17	13	121	425	323	14	542	4.3	10.9	108	<0.2	<0.5	<0.5	<0.5	<10	950
4/08/2017	BH19 2.5-2.6	<5	40	<1	<1	4	3	8	10	120	4	5	<0.1	<0.5	1.2	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH20 0.5-0.6	<5	70	<1	<1	4	11	50	80	593	16	71	0.1	2.5	23.8	<0.2	<0.5	<0.5	<0.5	<10	130
4/08/2017	BH20 2.5-2.6	<5	1660	<1	<1	26	22	54	14	249	20	24	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH21 0.5-0.6	<5	120	<1	<1	12	11	68	249	376	15	237	0.5	90.1	1590	<0.2	<0.5	<0.5	<0.5	<10	6090
4/08/2017	BH21 2.1-2.2	<5	80	<1	<1	14	14	39	67	178	12	52	1.2	7.2	134	<0.2	<0.5	<0.5	<0.5	<10	480
4/08/2017	BH22 0.5-0.60	<5	190	<1	<1	30	29	68	<5	546	31	18	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH01 0.4-0.8m	<5	90	<1	<1	13	16	63	83	274	15	100	0.2	79.9	676	<0.2	<0.5	<0.5	<0.5	<10	4220
15/03/2016	TH01 2.5-2.6m	8	90	<1	<1	31	14	57	52	224	25	43	0.1	1.3	13.8	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH01 4.2-4.5m	7	80	<1	<1	14	11	56	109	234	15	109	0.2	77.7	871	<0.2	<0.5	<0.5	<0.5	<10	3290
15/03/2016	TH02 0.4-0.8m	<5	50	<1	<1	5	32	68	67	142	11	181	<0.1	30.4	292	<0.2	<0.5	<0.5	<0.5	<10	2010
15/03/2016	TH03 0.5-0.6m	<5	20	<1	<1	4	2	7	8	90	3	19	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH03 1.5-1.6m	<5	180	<1	<1	6	28	35	9	32	24	31	<0.1	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH03 3.2-3.4m	<5	10	<1	<1	6	2	<5	<5	46	4	12	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH04 0.5-0.6m	<5	110	<1	<1	12	8	69	162	315	17	337	0.2	10.2	66.1	<0.2	<0.5	<0.5	<0.5	<10	470
15/03/2016	TH04 3.5-3.6m	6	10	<1	<1	8	4	8	11	51	7	20	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH05 0.5-0.6m	<5	30	<1	<1	13	16	65	5	769	25	40	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH05 2.0-2.1m	<5	40	<1	<1	15	14	90	49	620	22	52	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH06 0.5-0.6m	<5	140	<1	<1	27	23	65	<5	373	29	22	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH05 4.5-4.6m	<5	80	<1	<1	16	17	18	6	159	12	14	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH06 2.0-2.1m	<5	80	<1	<1	17	13	57	28	434	22	48	0.1	0.6	3.1	<0.2	<0.5	<0.5	<0.5	<10	140
15/03/2016	TH06 4.5-4.6m	<5	<10	<1	<1	6	4	<5	<5	46	4	9	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	BH07 0.4-0.5m	<5	120	<1	3	10	11	56	404	281	13	305	0.4	31.1	636	<0.2	<0.5	<0.5	<0.5	<10	4260
15/03/2016	BH07 3.3-3.4m	<5	50	<1	<1	11	9	22	36	102	9	28	0.6	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH08 0.5-0.6m	<5	150	<1	<1	13	24	43	13	231	18	37	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH08 2.5-2.6m	<5	280	<1	<1	30	16	56	<5	413	25	10	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH09 0.4-0.5m	<5	30	<1	<1	21	9	18	7	57	10	13	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH10 0.4-0.5m	<5	80	<1	<1	13	11	52	208	500	12	176	0.4	116	1070	<0.2	<0.5	<0.5	<0.5	<10	3570
16/03/2016	BH11 0.4-0.5m	14	130	<1	2	22	15	61	196	352	34	566	3.2	6.4	44.8	<0.2	<0.5	<0.5	<0.5	<10	390
16/03/2016	BH11 2.7-2.8m	<5	40	<1	<1	8	10	76	158	237	10	135	0.1	4.7	35.9	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH12 0.3-0.4m	<5	80	<1	<1	8	11	18	488	237	9	421	0.1	3.4	27.6	<0.2	<0.5	<0.5	<0.5	<10	380
16/03/2016	BH12 1.5-1.6m	<5	120	<1	<1	24	25	114	46	502	22	383	0.1	3.5	26.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH12 2.9-3.0m	7	480	1	<1	16	44	43	24	200	52	45	0.2	1.5	22.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH13 0.3-0.4m	<5	120	1	<1	13	16	13	45	342	12	66	<0.1	<0.5	2	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH13 1.0-1.1m	<5	130	<1	<1	12	10	16	69	189	9	50	0.3	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	BH10 2.1-2.2m	<5	30	<1	<1	22	15	27	18	147	16	28	0.1	2.5	50.2	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	BH10 3.4-3.5m	<5	60	<1	<1	15	10	36	79	175	10	73	0.6	57.2	1300	2.6	4.4	<0.5	9.7	24	3240
Averaging		1.259	142.22	0	0.19	11.52	13.41	49.63	192.48	248.48	13.52	122.33	0.44	16.7	199	0.01	0	0	0	0	1077.04

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Level 6, 134 Macquarie Street, Hobart TAS
GPO Box 1550, Hobart, TAS 7001 Australia

INFORMATION BULLETIN No. 105

Environmental Management and Pollution Control (Waste Management) Regulations 2010

CLASSIFICATION AND MANAGEMENT OF CONTAMINATED SOIL FOR DISPOSAL

November 2012

1. Introduction

This bulletin defines the criteria used by the Environment Protection Authority (EPA) for the classification of contaminated soil that requires treatment and/or off-site disposal, and outlines the management of each classification in accordance with the *Environmental Management and Pollution Control (Waste Management) Regulations 2010* (the 'Regulations'). Although criteria set out in this bulletin have been determined for soil, they may be applicable to the classification of other solid waste material on an 'as needs basis' (see section 2.2.3). Please note, for the purposes of this Bulletin soil also includes dredge spoil (refer Section 2.2.5).

This bulletin is designed to be used by waste producers, consultants, local government, waste transporters and landfill operators that are responsible for determining whether potentially contaminated soil is suitable to be disposed of at a landfill, in assessing alternative options for contaminated soil management and how to make an application for disposal approval to the EPA.

The EPA encourages effective waste management by promoting on-site remediation, treatment and/or re-use, where appropriate, as the preferred options for dealing with contaminated soil. In accordance with the hierarchy of waste management options, direct disposal of soil to landfills should be used only when no other approved method of dealing with the contaminated soil is available. For further details on these waste management principles, see Section 1.2 of the *Landfill Sustainability Guide 2004* (DPIWE, 2004).

Treatment, re-use options and disposal of soil will be assessed and approved on a case by case basis by the Director, EPA ('the Director') or the Director's delegate.

2. Classification

The EPA uses 4 categories to classify contaminated soil: (Level 1) *Fill Material*; (Level 2) *Low Level Contaminated Soil*; (Level 3) *Contaminated Soil*; and (Level 4) *Contaminated Soil for Remediation*, Table 1 below summarises each classification.

Criteria in Table 2 below shows the maximum total concentration, and the maximum leachable concentration values for specific pollutants that are used to classify soil for off-site disposal. For soils classified as potentially acid sulfate soils (PASS), the criteria in Table 2 do not apply. Determination of risk associated with these soils should be conducted in line with the *Tasmanian Acid Sulfate Soil Management Guidelines* published by Department of Primary Industries, Parks, Water and Environment (refer Section 2.2.5).

Potentially contaminated soils are classified by analysis of representative samples of the soil and comparison of the results to the chemical concentrations given in Table 2.

It is not necessary to sample for all contaminants listed in Table 2 for soil classification. However, all contaminants that are reasonably likely to be present in the soil above background levels should be included in the sample analysis.

Generally, where a leachable concentration is prescribed in Table 2 that value takes precedence over the total concentration and is used as the sole determinant of final classification for disposal (see section 2.2.4 for further information).

Please note that these values in Table 2 are ***not*** to be interpreted as clean up target levels for certain land uses.

Table 1. Summary of the classification process

	Classification (with reference to Table 2)	**Controlled Waste**[1]	**Comments**
Fill Material[2] **(Level 1)**	Soil that exhibits levels of contaminants below the limits defined under *Fill Material* in Table 2.	Unlikely	Soil classified as *Fill Material* can still be a 'pollutant' under the *Environmental Management and Pollution Control Act 1994* and needs to be responsibly managed.
Low Level Contaminated Soil (Level 2)	Soil that exhibits levels of contaminants above the limits defined under *Fill Material* but below the limits defined under *Low Level Contaminated Soil* in Table 2.	Likely	Where leachable concentrations have not been prescribed, maximum total concentrations will be used to classify the soil.
Contaminated Soil (Level 3)	Soil that exhibits levels of contaminants above the limits defined under *Low Level Contaminated Soil* but below the limits defined under *Contaminated Soil* in Table 2.	Yes	Where leachable concentrations have not been prescribed, maximum total concentrations will be used to classify the soil.
Contaminated Soil for Remediation (Level 4)	Soil that exhibits levels of contaminants above the limits defined under *Contaminated Soil* in Table 2 (regardless of the maximum total concentrations) is generally ***not*** considered acceptable for off-site disposal without prior treatment.	Yes	Soil that contains contaminants that do not have criteria for leachable concentrations (*e.g.* petroleum hydrocarbons), and the levels of contaminants exceed the maximum total concentrations listed in *Contaminated Soil*, are generally classified as *Contaminated Soil for Remediation*.

[1] Controlled Waste is defined in the *Environmental Management and Pollution Control Act 1994*.
[2] Criteria for *Fill Material* are the limits set by the Director for the purposes of R.9(2)(a)(ii) in the *Regulations*.

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Table 2. Maximum total concentration and leachable concentration values permitted for waste classification (Note, does not apply for material classified as PASS, refer section 2.2.5)

	FILL MATERIAL Level 1	**LOW LEVEL CONTAMINATED SOIL** Level 2		**CONTAMINATED SOIL** Level 3	
CONTAMINANT	Maximum total concentration mg/kg dry weight	Maximum total concentration mg/kg dry weight	Maximum (TCLP) leachable concentration (pH 5.0 extract) mg/L	Maximum total concentration mg/kg dry weight	Maximum (TCLP) leachable concentration (pH 5.0 extract) mg/L
Arsenic	20	200	0.5	750	5
Barium	300	3,000	35	30,000	350
Beryllium	2	40	1	400	4
Cadmium	3	40	0.1	400	0.5
Chromium (total)	50	500	0.5	5,000	5
Chromium (VI)	1	200	NA*	2,000	NA
Copper	100	2,000	10	7,500	100
Cobalt	100	200	NA	1,000	NA
Lead	300	1,200	0.5	3,000	5
Manganese	500	5,000	25	25,000	250
Mercury (total)	1	30	0.01	110	0.1
Molybdenum	10	1,000	2.5	4,000	20
Nickel	60	600	1	3,000	8
Selenium	10	50	0.1	200	1
Silver	10	180	0.5	720	5
Tin (total)	50	500	NA	900	NA
Zinc	200	14,000	25	50,000	250
Tributyltin (reported as Sn)	0.005	0.07	0.05	0.7	0.5
Aldrin + Dieldrin	2	20	0.003	50	0.03
DDT + DDD + DDE	2	200	0.2	1,000	2
Benzo(a)pyrene	0.08	2	0.0005	20	0.005
Phenols	25	500	14	2,000	50
C_6-C_9 petroleum hydrocarbons	65	650	NA	1,000	NA
C_{10}-C_{36} petroleum hydrocarbons	1,000	5,000	NA	10,000	NA
Polycyclic aromatic hydrocarbons (total)	20	40	0.0005 TEQ**	200	NA
Polychlorinated biphenyls (PCBs)	2	20	0.001	50	0.002
Benzene	1	5	0.05	50	0.5
Toluene	1	100	1.4	1,000	14
Ethylbenzene	3	100	3	1,080	30
Xylene (total)	14	180	5	1,800	50
Cyanide (total)	32	1,000	1	2,500	10
Fluoride	300	3,000	15	10,000	150

*NA – a leachable concentration has not been prescribed (refer Table 1 above)
** For guidance refer to http://epa.tas.gov.au/regulation/document?docid=1083

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2.1 Controlled waste

Contaminated soil may or may not be a controlled waste as defined in the *National Environment Protection Measure for the Movement of Controlled Waste between States and Territories* (NEPC, 1998) and the *Environmental Management and Pollution Control Act 1994* (EMPCA) and as further prescribed in the Regulations.

Soil and other material reasonably suspected to be a controlled waste must be sampled and analysed to determine whether it is a controlled waste before that waste can be removed from the site (R.6(3) of the Regulations). This generally includes, but is not limited to soil that is from a site that is used, or has been used, for an activity listed in Table 3 and is likely to be contaminated.

Special provisions apply to the management of controlled waste, as detailed in section 3 of this bulletin. As a general rule all *Low Level Contaminated Soil*, *Contaminated Soil* and *Contaminated Soil for Remediation* that is intended for treatment, re-use or disposal should be managed as controlled waste unless sampling proves otherwise.

2.2 Sampling and analysis

The waste producer is responsible for organising the sampling and analysis of potentially contaminated soil. It is recommended that a suitably qualified person perform all sampling. Additionally, all soil sampling should be conducted in accordance with the relevant Australian Standards, which include:

- AS 4482.1-2005 Guide to the investigation and sampling of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds (and any subsequent editions)
- AS 4482.2-1999 Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances (and any subsequent editions)
- In the case of potentially Acid Sulfate Soils, the *Tasmanian Acid Sulfate Soil Management Guidelines* published by Department of Primary Industries, Parks, Water and Environment should be consulted.

In-situ sampling is generally not recommended for classification of soils that are to be excavated later for disposal. However, if this method of classification is unavoidable, then the Australian Standards listed above should be adhered to in order to obtain a representative number of samples.

All sample analyses must be conducted by a laboratory registered with the National Association of Testing Authorities, accredited for the testing procedures undertaken ('NATA accredited'), or by a laboratory approved by the Director for the test.

2.2.1 Sampling density

The number of samples required for adequate classification of soil is dependent on the volume of material, the estimated standard deviation of contamination concentrations, and the estimated average concentration. However, as a general rule for homogeneous stockpiled soil one sample should be taken every 25 m^3.

2.2.2 Composite sampling

Generally, composite samples are not recommended for classification of soil for disposal. However, composite sampling may assist an environmental program by reducing sampling costs that could be spent elsewhere in the program. Composite sampling is only acceptable for stockpiled soil containing non-volatile contaminants

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and is **not** an acceptable method for sampling of volatiles such as some hydrocarbon-contaminated soil.

All composite sampling should be undertaken by a suitably qualified person and in accordance with the Australian Standards AS 4482.1-2005 and the National Environmental Health Forum Monograph, Soil Series No. 3 – *Composite Sampling*, 1996.

2.2.3 Sampling materials other than soil

For materials such as contaminated construction materials there are no guidelines available for determining the representative number of samples for testing. Surface scrapings or bored samples may be required to classify the material. The person undertaking the sampling, preferably an environmental consultant should develop a sampling strategy and density that adequately classifies the material.

2.2.4 Leachable fraction

In order to classify soil for disposal, the leachable concentrations of metals and some organics should be undertaken. Where a leachable concentration is prescribed in Table 2, generally that value will take precedence over the total concentration value and will be used as the sole determinant of final classification for disposal.

The most appropriate procedure for determining the leachable fraction should be determined in consultation with an environmental consultant, the EPA and the analytical laboratory performing the procedures and with consideration of the waste management goals that are to be achieved. Accepted methods for determining leachable fractions are detailed below:

The Toxicity Characteristic Leaching Procedure (TCLP), in accordance with USEPA Method 1311 – SW 846, is used to simulate the leaching of contaminants into groundwater under conditions found in solid waste landfills.

The Multiple Extraction Procedure (MEP), in accordance with USEPA MEP Method 1320 – SW 846, is used to simulate leaching from repetitive acid washings and is a more rigorous test of the buffering capacity of the soil than the TCLP. In some circumstances (*e.g.* for remediation technologies that involve solidification with lime based agents), the MEP would be a more suitable test to determine the long-term stability of soil.

There is also an Australian Standard for the preparation of leachates: AS 4439-1997 (parts 1 to 3), *Wastes, Sediments and Contaminated Soils: Preparation of Leachates*.

2.2.5 Acid sulfate soils

Potentially Acid Sulfate Soils (PASS) underlie parts of Tasmania's coastline and may also underlie inland areas such as peat bogs, salt lakes and wetlands. They are natural soils that contain sulfides (mostly iron sulfides). In an undisturbed and waterlogged state these soils are harmless, but when disturbed (such as dredging estuaries etc), a process of oxidation can produce sulfuric acid in large quantities. As the acid moves through the soil profile it may 'mobilise' or cause the release of metals and other toxins from the soil, which eventually flow into surrounding waterways. Acid Sulfate Soil (ASS) runoff therefore has significant environmental, economic and social impacts. The *Tasmanian Acid Sulfate Soil Management Guidelines* provide guidance on the level of management required to minimise the risk associated with ASS. The *Guidelines* also provide criteria to characterise acid sulfate soils. The criteria in Table 2 of this Bulletin do not apply to any soils classified as PASS. Such soils should be managed as potentially acid sulfate soils. Acid Sulfate Soil predictive mapping is available for Tasmania at www.thelist.tas.gov.au. For further information regarding ASS, instructions on how to utilise the predictive mapping, or obtain a copy of the *Guidelines*, refer to:

http://www.dpiw.tas.gov.au/inter/nsf/WebPages/SWEN-83NVBG?open

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3. Re-use or disposal - waste management plan

A Waste Management Plan should be developed following the classification of soil to determine whether the soil can be remediated or re-used instead of, or prior to, disposal (see Figure 1, which summaries this process, and section 5 which details the information required).

It should be noted that a controlled waste will not be suitable for re-use in sensitive environments such as wetlands, agricultural areas or residential sites.

4. Disposal of contaminated material

Classification of soil (as defined in Table 2) will determine the category of landfill to which the soil can be disposed of in accordance with the landfill operator's permit conditions.

If disposal is the only viable management option, all possible efforts should be made to reduce the volume of material requiring disposal by minimising excavated volumes and segregating and sorting of wastes prior to disposal.

Waste Type	Category A landfill - **Solid Inert Landfill**	Category B landfill - **Putrescible Landfill**	Category C landfill - **Secure landfill**
Level 1 – *Fill Material*	✔	✔	✔
Level 2 – *Low Level Contaminated Soil*	✘	✔ (refer to Section 4.2.2)	✔
Level 3 - *Contaminated Soil*	✘	✘	✔
Level 4 - *Contaminated Soil for Remediation*	✘	✘	✘

See the *Landfill Sustainability Guide 2004* (DPIWE, 2004) for further details.

4.1 Disposal of fill material (Level 1)

4.1.1 The off-site disposal of *Fill Material* is not restricted and may be used as cover in landfills.

4.1.2 The definition of *Fill Material* includes inert construction material, soils and rocks, which have not been contaminated with any substance, and stable asphalt or bituminous pavement material, all of which are generally considered inert for use as 'fill'. However, soil and other material classified as *Fill Material* can still be a 'pollutant' under EMPCA and must be responsibly managed.

Re-use of fill material

4.1.3 The re-use of *Fill Material* must not result in environmental harm. *Fill Material* might contain contaminants above background levels and therefore may not be suitable for all uses, *e.g.* for sensitive uses such as child play areas, residential uses, or in protected nature reserves

4.1.4 In some cases, unwanted 'waste' soils or rock imported from another site to be used as fill may naturally contain contaminants at levels that are higher than *Fill Material* criteria due to regional geological characteristics. This material would be regarded

as unsuitable for re-use if it posed a risk to human health or the environment in its new location.
The risk posed by importation of materials with naturally elevated levels of certain contaminants should be assessed by an environmental consultant and the evaluation and supporting information submitted to the Director for approval.

4.2 Disposal of low level contaminated soil (Level 2)*Low Level Contaminated Soil* may, in some cases, be suitable for disposal as intermediate landfill cover at nominated municipal landfills. Please note that the landfill operator should refuse soil that has not been classified and approved if there is likelihood that acceptance of the material may result in a breach of the landfill operator's permit conditions.

4.2.2 Approval for the disposal of *Low Level Contaminated Soil* must be sought from the landfill operator and the EPA. The information detailed in section 5 of this bulletin must be supplied to the EPA when making an application for approval to dispose of a waste.

Landfills at which *Low Level Contaminated Soil* (Level 2) may be accepted:

Council / Authority	Landfill
Circular Head Council	Port Latta Waste Depot
Dulverton Regional Waste Management Authority (DRWMA)	Dulverton Regional Waste Depot
Launceston City Council	Remount Rd Waste Depot
Copping Refuse Disposal Site Joint Authority	Copping Waste Depot

Re-use of low level contaminated soil

4.2.3 *Low Level Contaminated Soil* might be suitable for re-use as fill or levelling material on an industrial or commercial site, but will be judged on a case by case basis. In determining whether *Low Level Contaminated Soil* may be used as fill, an assessment of the environmental and human health hazards associated with the disposal option must be conducted by a suitably qualified environmental consultant. If the soil is classified as a controlled waste, approval must be sought from the Director as detailed in section 5.

4.3 Disposal of contaminated soil (Level 3)*Contaminated Soil* can only be disposed of at landfills that have the appropriate permit conditions and within a separate lined and contained cell.

4.3.2 Approval for the disposal of *Contaminated Soil* must be sought from the landfill operator and the EPA. The information detailed in section 5 of this bulletin must be supplied to the EPA in making an application for approval.

4.3.3 Only permitted landfills are allowed to accept Level 3 waste. Furthermore, it is at the landfill operator's discretion as to whether or not they will accept the waste. At the date of publication, no Tasmanian landfill is receiving level 3 waste for disposal.

4.4 Contaminated soil for remediation (Level 4)

4.4.1 *Contaminated Soil for Remediation* requires remediation or treatment prior to disposal to reduce total concentrations and/or leachable concentrations to levels acceptable for landfill disposal or re-use.

4.4.2 The producer (defined in the Regulations) of the *Contaminated Soil for Remediation* is responsible for identification of the treatment options, which will depend on the

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waste and pollutant type, waste volumes and the availability of suitable facilities in which to manage the remediation. Typical forms of treatment currently being used for remediation of contaminated soil include bioremediation, thermal treatment/desorption, soil washing, soil vapour extraction, red mud, chemical treatments and stabilisation. Specific treatment of hydrocarbon contaminated soil by bioremediation is encouraged under appropriate circumstances, as detailed in the EPA's *Information Bulletin 108: Landfarming of Petroleum Contaminated Soils*.

4.4.3 The suitable technologies for waste treatment may not be available in Tasmania and thus treatment may require transport to an interstate facility. Advice on interstate treatment options should be sought from the Controlled Waste Management Officer.

4.4.4 If the soil is to be disposed of after treatment, the EPA encourages treatment methods that minimise soil volumes prior to disposal to conserve landfill space.

4.4.5 If the remediation method has the potential to cause environmental harm, as defined in EMPCA, advice from the Director should be sought.

4.4.6 *Regulation 6 - General Responsibilities* of the Regulations requires that a person must not remove, receive, store, reuse, recycle, reprocess, salvage, incinerate, treat or use for energy recovery a controlled waste as defined within the Regulations unless approved to do so.

5. Approvals

5.1 Approval process

The waste producer, or consultant/contractor acting on behalf of the waste producer, is responsible for applying for approval for soil disposal, re-use options or remediation.

Applications are to be sent to the Director, EPA. Please allow up to ten working days for the Director to respond to an application. Please note that where it is intended to dispose of material to a landfill, an 'in principle' agreement from the landfill should be gained by the applicant prior to disposal.

Upon approval of the application, the Director, or a person authorised by the Director will provide written notification to the applicant of the approved classification of the waste where appropriate. The landfill authority will also be forwarded a copy of the approval, along with a copy of the analytical results and any other relevant information so that they can monitor waste entering the landfill.

5.2 Information required

An application for approval to dispose of, re-use, treat, remediate, *etc*, soil must contain the following information:

Introduction:

- Details of the site(s) from which the soil is to be removed, including a brief site history and why the soil is thought to be contaminated, or likely to cause environmental harm;
- Description of the soil;
- Estimate of the volume of soil to be managed.

Sampling details:

- Sampling density and analytical suite to classify the soil;
- Sampling protocols followed;

- Scaled sampling plan showing, for example, soil stockpiles and sample locations and contamination sources;
- NATA endorsed laboratory reports.

Waste management plan:

- Proposal for the management of the soil that is in accordance with relevant guidelines and standards;
- If the soil is to be disposed of, provide justification for why re-use, on-site treatment, *etc* is not proposed;
- Details of the proposed management method, for example the name of the landfill facility that you wish to dispose of the soil at, or details of the treatment or re-use *etc*;
- The name of the waste transporter that you will be utilising (see Section 6 for further details); and
- If the soil is to be re-used, recycled, treated, *etc*, and is a controlled waste, the waste producer must apply for an environmental approval from the Director (R.12 of the Regulations). Relevant information required by the EPA to consider an application for an environmental approval is detailed in R.12(3) of the Regulations. A R12 application form can be accessed at:
- http://epa.tas.gov.au/regulation/required-approvals-and-authorisations

In situations where a site investigation report has already been lodged with the EPA, duplication of information provided in that report is not required. However, in all cases, the application will need to make reference to the specific sample numbers used for soil classification.

6. Transport of contaminated material

If a controlled waste is to be transported, a waste transport business holding a current relevant approval for that particular waste type and issued under EMPCA is required. For information regarding currently approved Waste Transporters, either contact the Controlled Waste Transport Officer (see below) or a list can be accessed at:
http://epa.tas.gov.au/regulation/document?docid=1063

Caution should be taken when transporting any material to ensure its safe transportation and prevention of secondary impacts (*e.g.* dust).

7. Further information

For further information relating to this bulletin or to make a contaminated soil or controlled waste disposal application contact:

Waste Management Section
GPO Box 1550
HOBART TASMANIA 7001

Controlled Waste Management Officer.....
Contaminated Sites Officer.....
Controlled Waste Transport Officer .....
Landfill Officer.....

Legislation may be viewed on the Internet at http://www.thelaw.tas.gov.au.
General information can be viewed either on the EPA's website at http://www.epa.tas.gov.au

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8. Currency of this bulletin

This bulletin may be subject to amendment and persons relying on this bulletin should check with an officer of the Waste Management Section or on the above EPA Division and EPA websites to ensure that it is current at any given time.

Disclaimer
The Crown gives no warranty, express or implied, as to the accuracy or completeness of the information provided in this Bulletin. The contents are based on the best information available to the Environment Protection Authority (EPA) at the time of publication and are subject to revision based upon further advice received by the EPA.

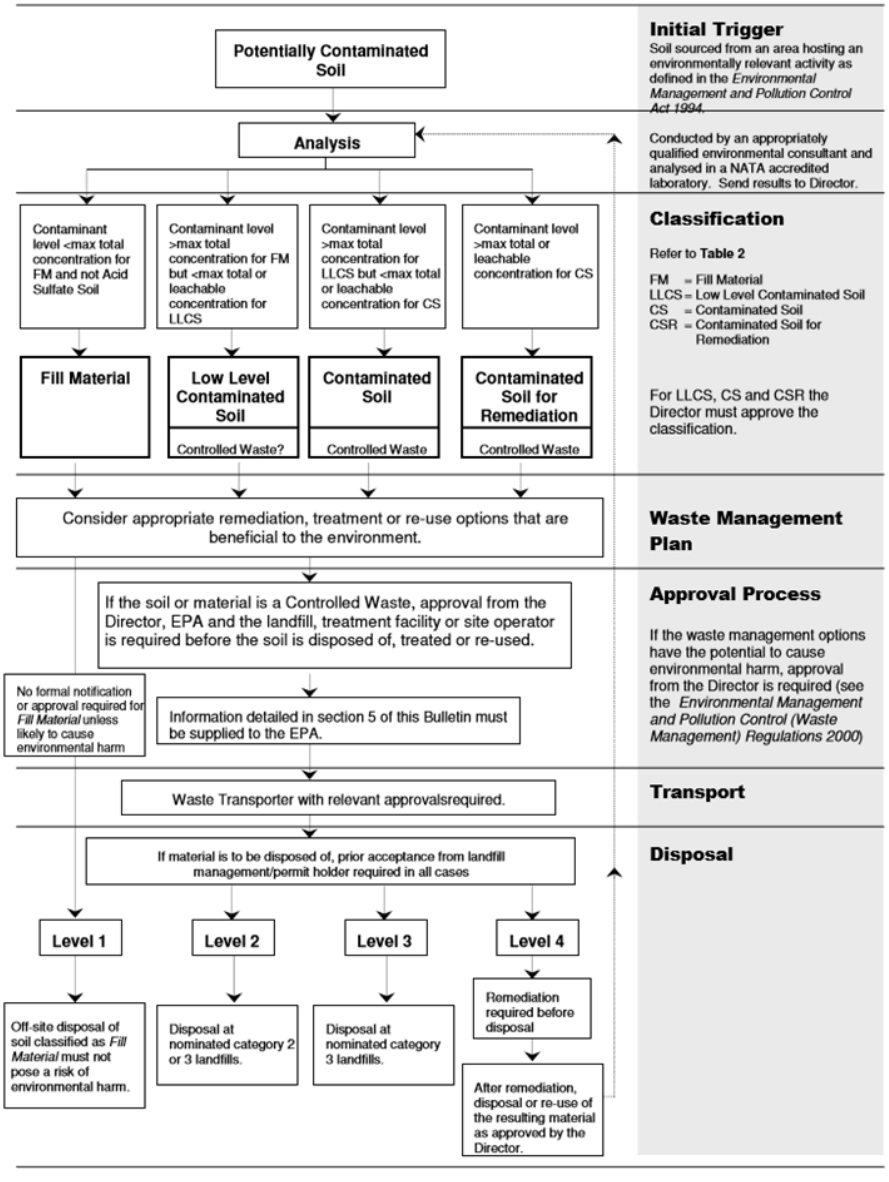
Please note that other national or state agencies may have additional requirements relating to the import/export and/or disposal of controlled wastes.

Table 3. Potentially Contaminating Activities

Potentially Contaminating Activities	
Acid / alkali plant and formulation	Landfill sites, including on-site waste disposal and refuse pits
Ammunition manufacture and usage (e.g. shooting ranges)	Lime burner
Asbestos production, handling or disposal	Metal treatments (e.g. electroplating) and abrasive blasting
Asphalt/bitumen manufacturing	Metal smelting, refining or finishing
Battery manufacturing or recycling	Mining and extractive industries
Boat/ship building, marinas, slip ways and associated boat yards	Oil or gas production or refining
Boiler or kiln usage	Paint formulation and manufacture
Chemical manufacture and formulation (e.g. fertilisers, paints, pesticides, photography, plastics, solvents)	Pesticide manufacture and formulation sites
Dewatering of sediments	Petroleum product or oil storage
Disturbance of potential acid sulfate soils	Pharmaceutical manufacture and formulation
Drum conditioning works	Power stations
Dry cleaning establishments	Printing
Electrical transformers	Radio-active material usage (e.g. hospitals)
Ethanol production plant	Railway yards
Engine works	Scrap yards and recycling facilities
Explosives industries and usage sites	Sewage treatment plant
Fertiliser manufacturing plants	Sheep and cattle dips
Fill material imported onto a site from a potentially contaminated source (includes dredge spoil)	Sites of fires involving hazardous materials, including fire fighting foam use
Foundry Operations	Spray mixing sites (e.g. for orchards)
Gas works	Spray painting industries
Herbicide manufacture	Tanning and associated trades
Hospitals	Textile operations
Sites of incidents involving release of hazardous materials	Tyre manufacturing and retreading works
Industrial activities involving chemicals that may have spilt	Wood preservation and storage or cutting of treated timber
Iron and steel works	Wool scouring
Laboratories	

IB105

Figure 1 Summary of Waste Management for Contaminated Soil.



GEO-ENVIRONMENTAL SOLUTIONS

ENVIRONMENTAL SITE ASSESSMENT Version 8

2 Collins Street Hobart

for Fragrance TAS – Hobart (Collins) Pty Ltd

31st July 2018

Geo-Environmental Solutions P/L 29 Kirksway Place Battery Point 7004. Ph 6223 1839

DOCUMENT CONTROL

Title	Version	Date	Author
Contaminated Site Assessment – 2 Collins Street	Original Document Version 1	April 2016	K. Taylor
Environmental Site Assessment Version 2 – 2 Collins Street	Version 2	August 2017	K. Taylor & S. Joyce
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Environmental Site Assessment Version 6 – 2 Collins Street	Version 6	3 July 2018	S. Joyce
Environmental Site Assessment Version 8 – 2 Collins Street	Version 7 Current Document	6 July 2018	J.P.Cumming
Environmental Site Assessment Version 8 – 2 Collins Street	Version 8 Current Document	26 July 2018	S. Joyce
Environmental Site Assessment Version 8 – 2 Collins Street	Version 8 Current Document	31 July 2018	K Taylor

EXECUTIVE SUMMARY

This report presents the findings of two environmental site assessment events, the first March 2016 and the second August 2017; undertaken by Geo-Environmental Solutions Pty. Ltd. (GES) at the former Roberts Limited site at 2 Collins Street, Hobart - hereby referred to as 'The Site'. GES was commissioned by Fragrance TAS – HOBART (Collins) Pty Ltd to conduct the site assessment. This is document *Version 8,* it contains minor amendments from previous versions.

The purpose of this investigation is to comply with Hobart City Council planning requirements and the Sullivan's Cove Planning Scheme 1997.

It is proposed that a multistory building development will cover the entire site which will include commercial premises on Level 0, Level 1 and Level 1a; carparking on Levels 2 to 4, a podium on Level 5, a pool and wellbeing rooms on Level 6 and hotel apartments from Level 7 to Level 14. There will be six lift and three staircases.

The proposed final floor level will be at 4.60m AHD which is approximately 1m above the current site level and approximately 1m of fill be required, give or take, across the entire site. All site surfaces are to be removed and subsequent excavations are expected to be minimal and will be required for services, the building footings and lift wells/stairs only. Appropriate soil disposal associated with the development will be required.

A preliminary site assessment was conducted which revealed a varied site usage history with potentially contaminating activities (areas of potential concern) including tanning operations, uncontrolled site filling, maintenance workshop and petroleum hydrocarbon storage.

An initial desktop and invasive soil and groundwater assessment conducted in March 2016, involved drilling a total of 13 soil investigation bores and the sampling of four out of five groundwater monitoring wells. A second invasive soil and groundwater assessment conducted in August 2017, involved the drilling of nine additional soil bores and the sampling four of the five existing groundwater monitoring wells. All information collected during these assessments is compiled within this document.

Within the identified areas of potential concern, samples were analysed for the following contaminants of potential concern;

- Suite of 15 Metals;
- Fuel type petroleum hydrocarbons; and
- Coal waste and kerosene related hydrocarbons.

Uncontrolled fill was encountered across much of the site to depths of greater than 3.3 m below ground surface with the deepest fill apparent in the center of the site along a former watercourse and within a historical water race running through the site. Fill comprised of mixed alluvial type clay, silt, sand and gravel sediments with occasional bricks. Fill in the local area is also known to contain significant amount of waste coal material from the historical Hobart Gas Works which is commonly contaminated with polynuclear aromatic hydrocarbons compounds. Natural underlying sediments comprised of clay, silt and sand of a similar composition to the fill.

Groundwater flow directions were discerned to be directed towards the center of the site at a very shallow gradient towards the original Hobart Town Rivulet stream channel to the southeast. Groundwater migrating from the site is likely to follow the path of least resistance and travel in an southeasterly direction towards Victoria Dock. It is unlikely that groundwater will travel towards the now enclosed Hobart Rivulet because in is upgradient to the site;

Guideline limits for assessing 90% protection of marine waters are not exceeded for hydrocarbons (polynuclear aromatic hydrocarbons) but are exceeded for heavy metals including copper, zinc and mercury in groundwater. The source of these compounds is interpreted to be coal waste products or general industrial activities which may source from offsite. Copper and zinc do not exceed soil ecological investigation levels.

GES understands that the existing surface material (bitumen, concrete and buildings) are to be removed, new fill brought to site and the site sealed with a concrete slab. During site development work, soil exposure may cause the mobilisation of some contamination, such as polynuclear aromatic hydrocarbons and heavy metals. Contaminated soil exposure should be minimsed and the contamination management plan should always be followed. Care should be taken to ensure that contaminated soil is not washed into storm water culverts which could ultimately enter the marine environment.

Onsite human health risk is identified from soil ingestion and soil dust inhalation (from lead and polynuclear aromatic hydrocarbons compounds). A single sample collected from the fill material was identified to present a dermal contact risk. Primary concerns are polynuclear aromatic hydrocarbons and lead compound exposure from excavated from fill at the site during site development works. The identified pathway is soil ingestion or dust inhalation risk to commercial workers. If the dust and stormwater runoff is not managed adequately, this may present a hazard to offsite residence and public within the surrounding areas. Without management there is a likley chance of contamination exposure to offsite receptors and a high associated risk to receptors.

Given that the proposed future ground floor is expected to be entirely paved with an additional 1 m of clean fill between the floor and the contaminated material; there is expected to be limited opportunity for contaminated soil exposure to future site users. There may be ongoing future risk to shallow trench workers however this is will only occur if excavations that are greater than 1m below the ground surface, where the existing site material is intercepted.

There is evidence of four historical underground storage tanks present at the site which held hydrocarbon fuels including diesel. There are no underground storage tank decommissioning records and the location of any remaining tanks has not been delineated by in invasive soil investigations to date (except for the subfloor tank in the building). Therefore, the one identified tank and any further tanks would require decommissioning according to Environmental Protection Authority regulations as part of site redevelopment. Benzene Toluene Ethylbenzene Xylene compounds are present in low concentrations in an isolated onsite bore indicating there is likely to have been historical product release.

GES have conducted extensive soil drilling and have not identified a petroleum vapour intrusion risk from hydrocarbons in soil or groundwater around the tank locations or anywhere on the site. An indoor or trench worker vapour intrusion risk is not apparent at the site based on the proposed development. This based on extensive testing of soil from surface to groundwater depths as well as groundwater sampling and analysis.

The most significant management issue at the site is the uncovering during excavation of polynuclear aromatic hydrocarbons and heavy metal contaminated soil within fill beneath the site. Highest concentrations of contaminants have been identified on the south-western side of the former Hobart Town Rivulet. The concentration of all IB105 compounds analysed at the site average out to level 1 except for:

- Total Recoverable Hydrocarbons - C^{10}-C^{36} which is level 2;
- Total polynuclear aromatic hydrocarbons is level 3; and
- Benzo(a)pyrene is level 3.

Given the historical industrial nature of the site, all excavated soil at the site is to be stockpiled systematically, tested for contamination and results are to be compared against IB105 guidelines and managed appropriately. Stockpile separation is recommended initially as preliminary findings indicate mixing is likely to produce a larger volume of soil which will need licensed disposal.

The Sullivan's Cove Planning Scheme 1997, Schedule 8 states that: *the applicant is to provide information to demonstrate that an appropriate level of cleanup of the site it to occur. Alternatively, the applicant is to demonstrate that the proposed activity will not result in an immediate or likely long term hazard to human health or the environment*. GES can confirm once the development is complete and the site is 100% sealed, there will be;

- No opportunity for exposure to soil contamination by commercial workers or guests to the property, thus mitigating the human health risk; and
- No opportunity for the infiltration of rainwater to mobilise metals or PAH's into the groundwater and/ or the marine environment.
- Minimal risk to human or environmental receptors as there will be no direct pathway-receptor links due to the constructed buildings and surface cover on site

The conclusions and recommendations in this report are based only on information which was obtained during compilation of the site history and on analytical results obtained during the two invasive soil and groundwater investigations. Some of the conclusions and recommendations contained herein may change if the information upon which they are based is later found to be incorrect or incomplete and/or if additional information is subsequently found.

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ABREVIATIONS

ADWG	Australian Drinking Water Guidelines
APC	Areas of Potential Concern
AHD	Australian Height Datum
ALS	Analytical Laboratory Services
ANZECC	Australia and New Zealand Environment and Conservation Council
AWQG	Australian Water Quality Guidelines
BGS	Below Ground Surface
BH	Borehole
BTEX	Benzene Toluene Ethylbenzene Xylene
CEC	Cation Exchange Capacity
COA	Certificate of Analysis
COC	Chain of Custody
COPC	Chemical of Potential Concern
CRC CARE	Corporative Research Centre for Contamination Assessment and Remediation of the Environment
CSM	Conceptual Site Model
CMP	Contamination Management Plan
DWS	Depth Water Struck
EC	Electrical Conductivity
EIL	Ecological Investigation Levels
ESL	Ecological Screening Levels
EMPCA	Environmental Management and Pollution Control Act 1994
ESA	Environmental Site Assessment
GDA94	Geocentric Datum of Australia 1994
GES	Geo-Environmental Solutions Pty. Ltd.
GME	Groundwater Monitoring Event
HIL	Health Investigation Levels
HSL	Health Screening Levels
IP	Interface Probe
LNAPL	Light non-aqueous phase liquids
MCRWBA	Minimum Construction Requirements for Water Bores in Australia
MDL	Mean Detection Limit
NATA	National Association of Testing Authorities
NEPM	National Environmental Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
QC	Quality Control
PAH	Polynuclear Aromatic Hydrocarbons
PCP	Physico-Chemical Parameters
PESA	Preliminary Environmental Site Assessment

PEV	Protected Environmental Values
PHC	Petroleum Hydrocarbons
PID	Photo-Ionisation Detector
PPA	Preferential (PVI) Pathways Assessment
PSH	Phase Separated Hydrocarbons
PVI	Petroleum Vapour Intrusion
Redox	Reduction / Oxidation Potential
SCA	Site Contamination Assessment
SCS	Soil Classification System
SWL	Standing Water Level
TDS	Total Dissolved Solids
TH	Testhole
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
USCS	Unified Soil Classification System
UST	Underground Storage Tank

1 INTRODUCTION

1.1 General

This report presents the findings of two environmental site assessment (ESA) events, the first March 2016 and the second August 2017; undertaken by Geo-Environmental Solutions Pty. Ltd. (GES) at the former Roberts Limited site at 2 Collins Street, Hobart - hereby referred to as 'The Site'. The site location is presented in Figure 1. GES was commissioned by Fragrance TAS – Hobart (Collins) Pty Ltd to conduct the site assessment. This document *Version 8* contains minor amendments from previous versions.

This ESA has been prepared by a suitably qualified and experience practitioner in accordance with procedures and practices detailed in National Environmental Protection Measure (NEPM; 2013) guidelines and key regulations and policies identified in the References section of this document. Personnel engaged in preparing this ESA are listed in Appendix 1 along with their relevant qualifications and years of experience.

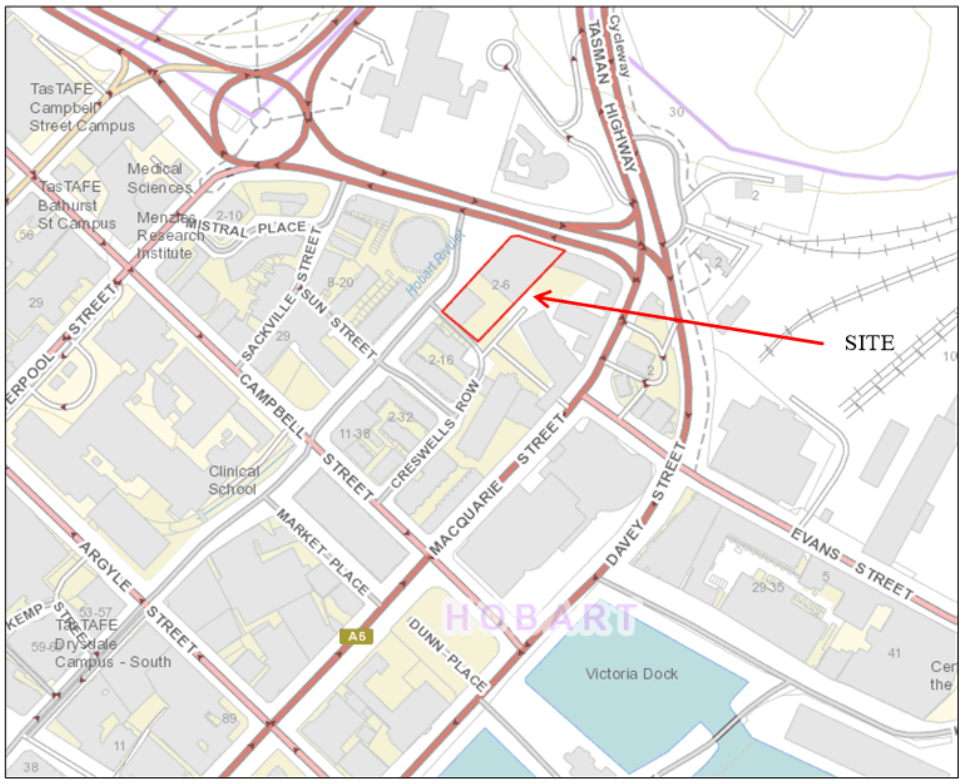


Figure 1 Site Location

1.2 Investigation Objectives

The objective of the ESA was to:

- Review the 'Preliminary Environmental Site Assessment' (PESA) report (Scherzic 2015);
- Assess the following at the site:
  - Chemicals of Potential Concern (COPC's);
  - Areas of Potential Concern (APC); and
  - Human and Environmental health risk.
- Determine the potential for offsite impact from site contamination, and implications for offsite ecosystem and human health receptors; and
- Provide recommendations for further assessment remediation and/or management (if required); and
- To comply with Hobart City Council planning requirements and the Sullivan's Cove Planning Scheme 1997.

1.3 Scope of Works

The scope of works of this ESA was to:

- Drill thirteen (13) soil bores at the site to identify potential human health risk to onsite receptors from potentially hydrocarbon impacted soil;
- Through additional soil sampling (an additional nine (9) soil bores) use soil analysis data to assist in:
  - Refine the conceptual site model;
  - Further delineating the extent of potential hydrocarbon leakage from the underground storage tanks (UST's); and
  - Refining the location of underground storage tanks infrastructure.
- Assess the viability of the existing groundwater monitoring wells for collecting representative samples for assessing potential onsite and offsite groundwater impact;
- Through two groundwater monitoring events (GME), collect groundwater from existing monitoring wells and sample for contaminates of concern;
- Detail specific onsite human health risk (hydrocarbon vapor intrusion and direct contact) which may source from any impacted soil and groundwater;
- Assess all risks with respect to proposed future land use which includes site demolition, soil excavation and commercial building development;
- Assess potential impact to surrounding offsite receptors; and
- Develop a conceptual site model (CSM) for the site and offsite if applicable to assess specific potential ecosystem and human health receptors.

1.4 Assessment Trigger

The need for this assessment has been triggered by the following:

- The ESA is a requirement for the Development Application.
- The site falls within the Hobart City Council contaminated site overlay and need to be assessed in accordance with the following interim planning scheme code:
  - *E2.6.2 Excavation*.
- Given that there is proposed ***excavation works*** at the site, there are no acceptable solutions to proposed works, and therefore E2.6.2 P1 performance criteria are to be addressed

1.5 Performance Criteria

Excavation does not adversely impact on health and the environment, having regard to:

(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or

(b) a plan to manage contamination and associated risk to human health and the environment that includes:

  i. an environmental site assessment;

  ii. any specific remediation and protection measures required to be implemented before excavation commences; and

  iii. a statement that the excavation does not adversely impact on human health or the environment.

The risk assessment herein depends on likely soil, groundwater or vapour exposure pathways based on:

- Present site conditions;
- Proposed development site layout and building construction; and
- Site earthworks.

2 SITE DETAILS

2.1 Site Location & Identification

Site details are presented in Table 1.

Table 1 Site Details

SITE LOCATION 2 Collins Street, Hobart, Tasmania
APPROXIMATE SITE AREA 3009 m^2
TITLE REFERENCES CT 121603/1
SITE OWNER Fragrance TAS-HOBART (Collins) Pty Ltd
PREVIOUS LANDUSE 1920's to 1960's – Residential, Roberts & Garage/Tram service 1860's to 1910's – Residential, Fellmonger & Tannery & Hobart Town Rivulet 1820's to 1860's - Residential, , Fellmonger Wool-strapping Hobart Town Rivulet & Slaughter yards
SITE LAND USE Zoned '1.0 Inner City Residential(Wapping)' under the Sullivan's Cove Planning Zone The current land use is considered commercial based on current land usage.
PROPOSED LAND USE It is proposed that the site will consist of hotel accommodation with supporting ancillary commercial activities.
SURROUNDING LAND USE Zoned '1.0 Inner City Residential(Wapping)' under the Sullivan's Cove Planning Zone. Existing surrounding land used includes residential and hotel accommodation, commercial office space
SITE COORDINATES MGA Zone 55: 527208 E 5252552 N

2.2 Planning

2.3 Site Zoning

The site is zoned Inner City Residential (Wapping) under the Sullivans Cove Planning Zones (Figure 2). The land use surrounding the site is consistent with the zoning; adjacent to the site land is Inner City Residential (Wapping) and beyond this block the land in the north, east and south are part of the Sullivans Cove Planning Scheme of 1997 and include Sullivans Cove Mixed Use, Sullivans Cove Gateway and Transport and Sullivans Cove Working Port. To the west is the Hobart CBD with the following zoning: Central Business, Commercial, utilities, and particular purpose including Royal Hobart Hospital and the UTAS campus.

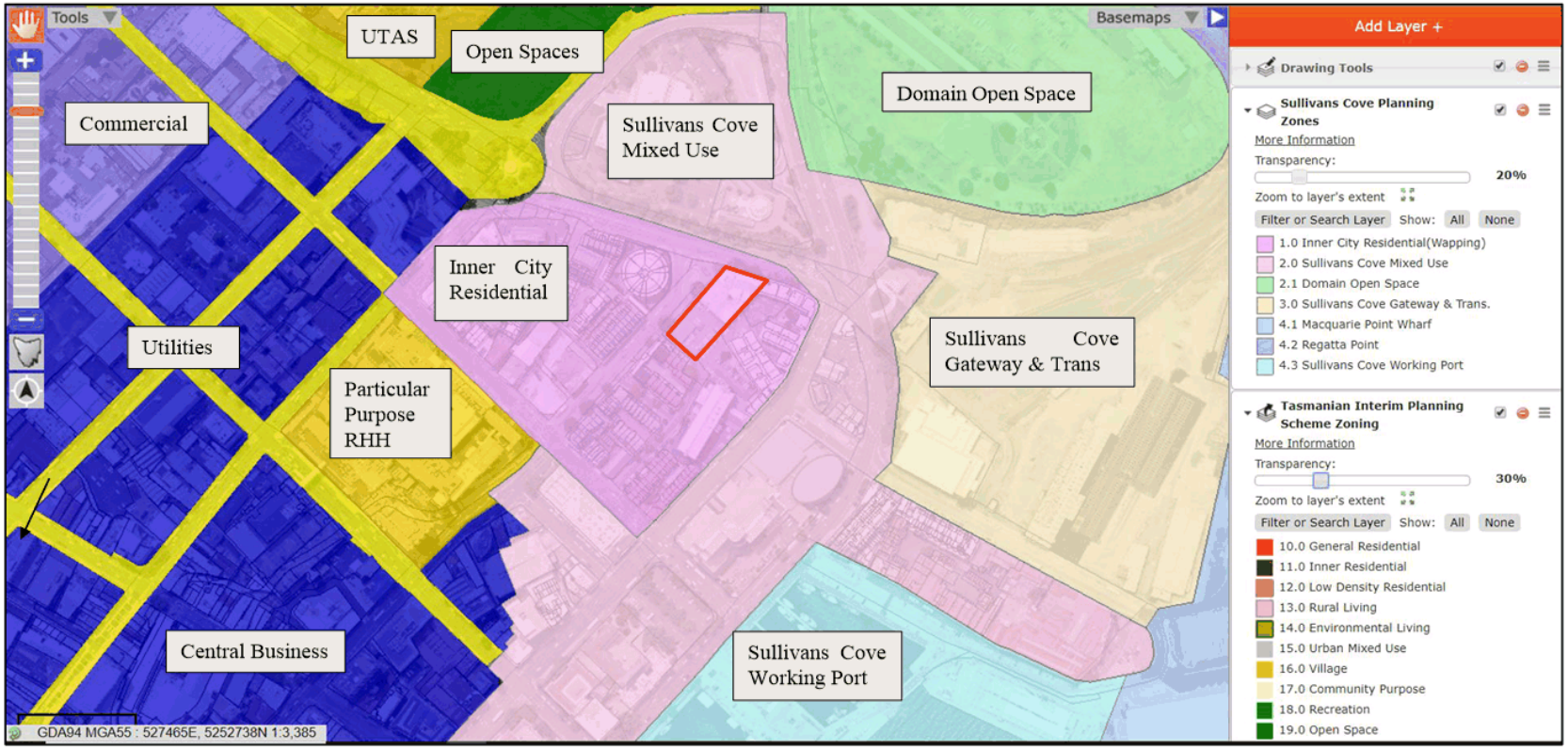


Figure 2 Council planning zones (2015), site outlined in red

2.4 Existing Site Layout

The existing site is made up of several buildings and a large paved area for carparking. See Figure 3.

2.5 Proposed Site Development Works

A hotel building is proposed for the entire site. The plans produced by S Group include the following:

- Ground floor – Level 0: (4.6 m AHD) Commercial premises including hotel reception, hotel restaurant, hotel kitchen, one retail outlet space, three office spaces several storerooms, a café kitchen and restaurant, a total of six lift, male and female toilets, ramp and drive way to access upper level carparking, a coach parking and deliver vehicle park. Figure 4
- Level 1: Commercial spaces including conference room with stage to seat 1000 people, kitchen, small conference room, two small conference rooms, toilets and lounge.
- Level 1a: Storage and administration spaces.
- Level 2 to 4: Designated carparking.
- Level 5: Podium
- Level 6: Pool and wellbeing rooms
- Level 7-14: Hotel rooms with some 2-3-bedroom configurations.

The proposed final floor level will be at 4.60m AHD which is approximately 1m above the current site level and approximately 1m of fill be required, give or take, across the entire site. Excavations are expected to be minimal and will be required for services, the building footings and lift wells only. Appropriate soil disposal associated with the development will be required.

Excavation works as part of the development is anticipated to include:

- Decommissioning existing infrastructure at the site which includes:
  - Bitumen surfaces,
  - All building infrastructure;
  - Redundant services across the site;
  -
- Leveling of the site;
- Installation of underground infrastructure such as pipes for water/ storm water and cables for electricity;
- Excavations/ drilling for the new buildings deep footings; and
- Shallow excavations for the cavity for the six lift wells and stair cases.

Soil which is excavated from the site for landfill disposal is to be assessed against Information Bulletin 105 (IB105) for Classification and Management of Contaminated Soil for Disposal.

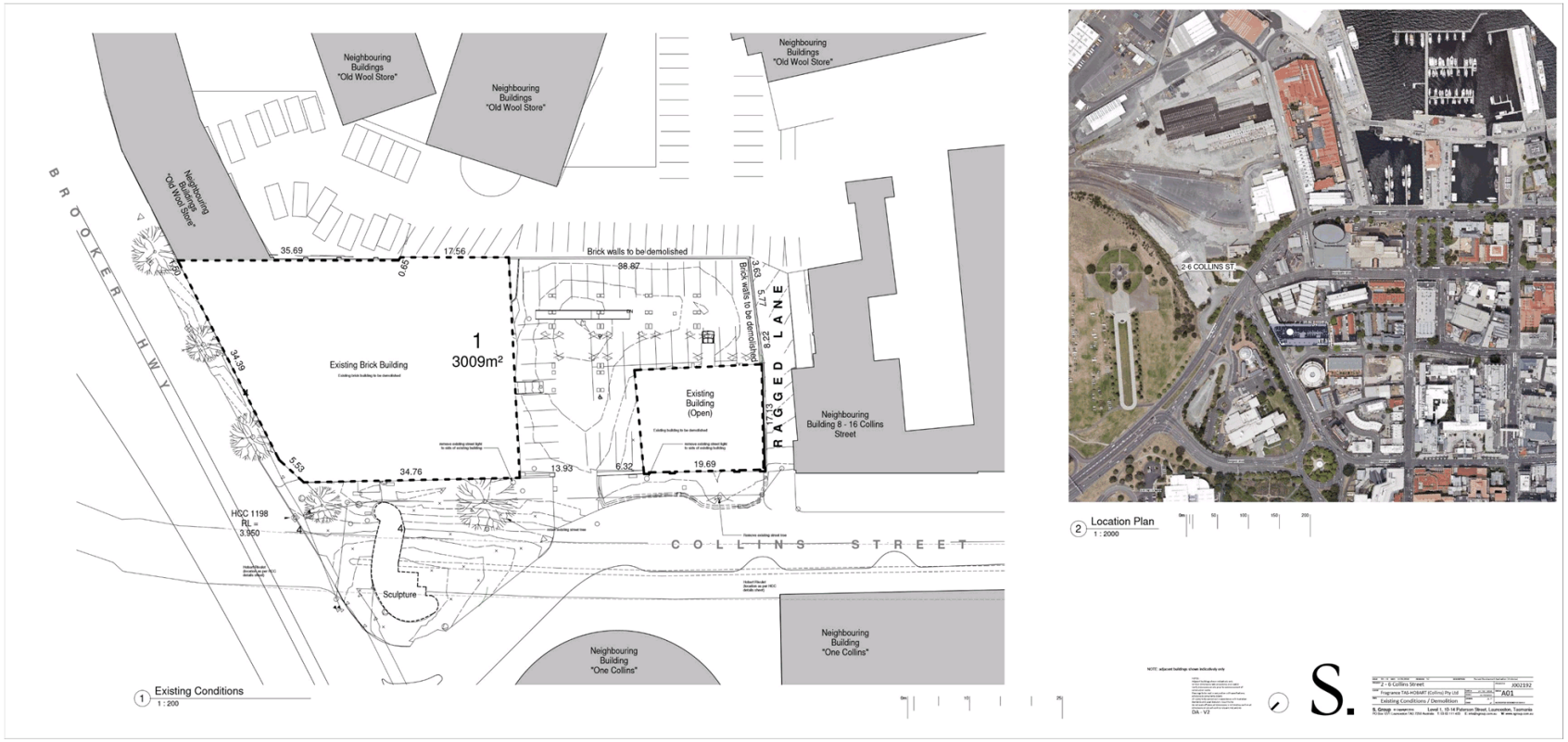


Figure 3 Exiting Site Plan

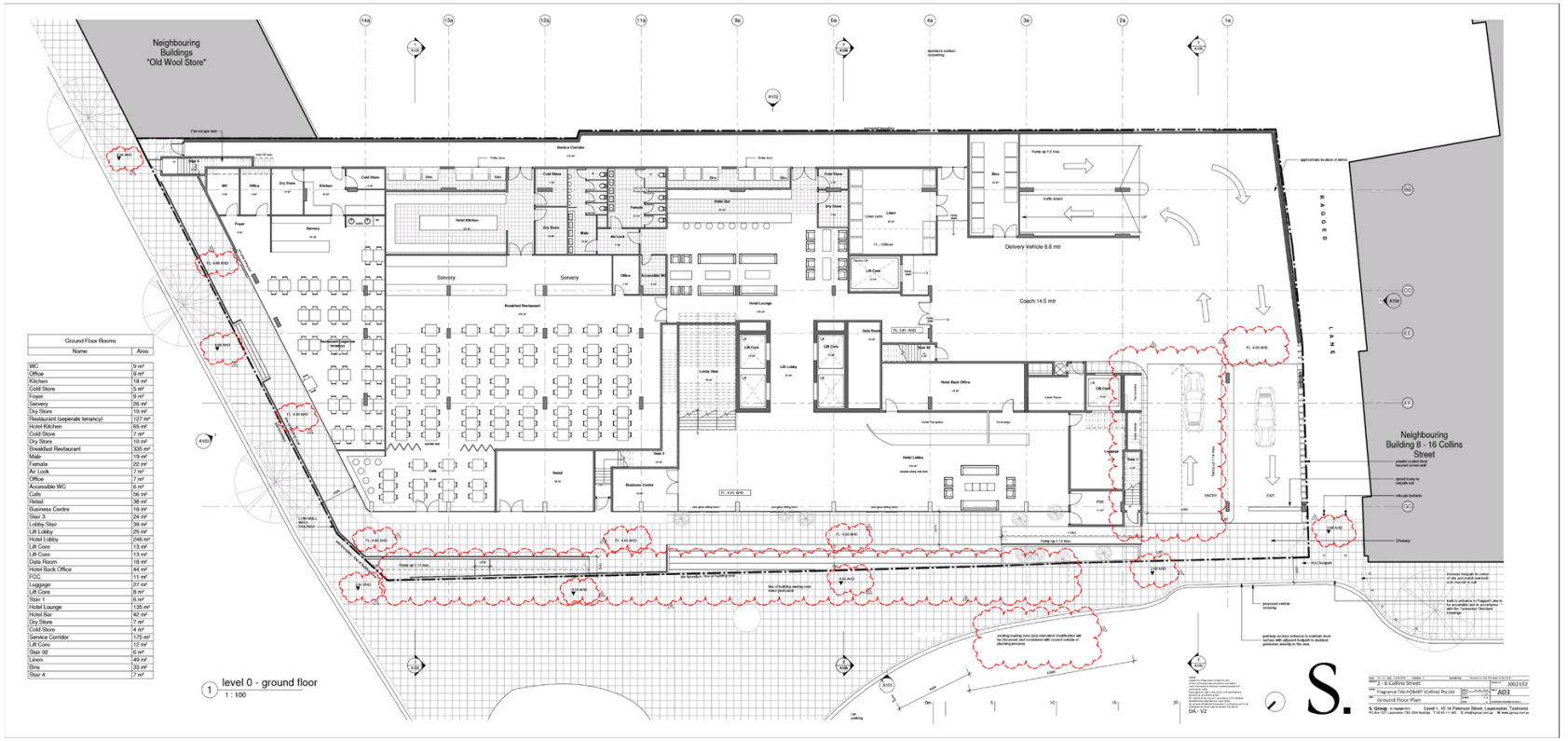


Figure 4 Proposed Ground floor Plan

2.6 Historical Drainage Conditions

Sprents Book Mosaic of Hobart Town (The LIST), published in 1841 illustrates the presence of a water race running to the north of the site, see Figure 5. The water race meets up with the former Hobart Town Rivulet which drains beneath the site. The Hobart Town Rivulet is inferred to have been infilled with manmade materials of unknown composition.

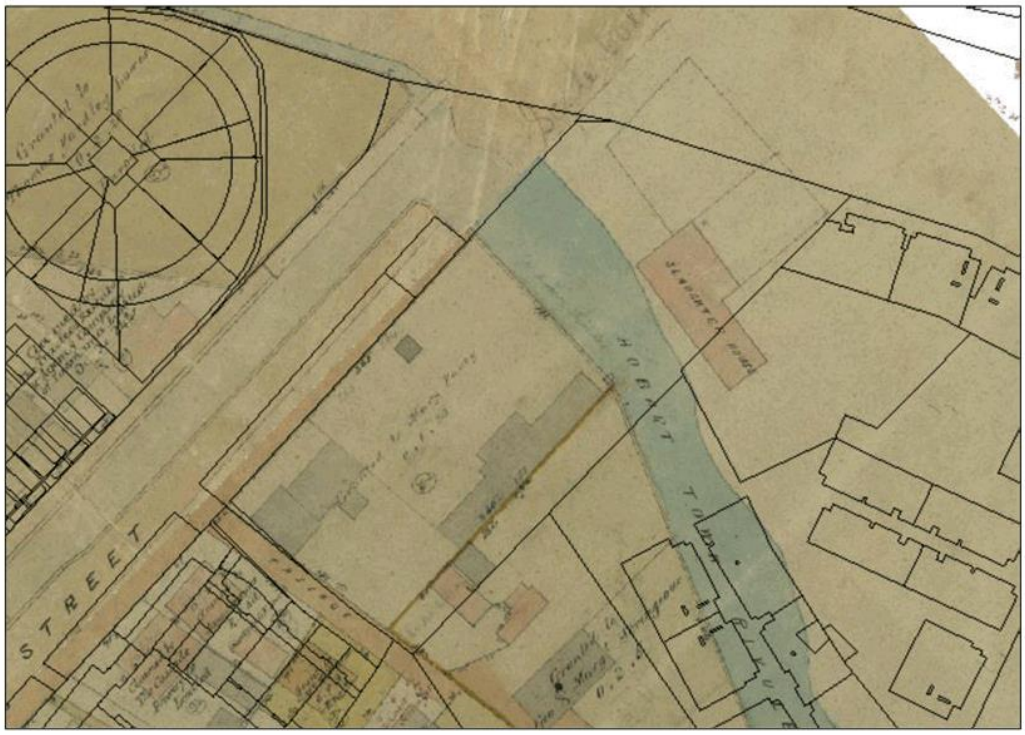


Figure 5 1841 Sprent Book Mosaic of Hobart Town (The LIST) Illustrating Historical Site Drainage

2.7 Current Drainage Conditions

As illustrated above, the historical drainage of the Hobart Rivulet was beneath the site. Over time the path of the Hobart Rivulet has been altered and diverted into a large enclosed drainage system, see the current path of the Hobart Rivulet in Figure 6.

Figure 6 Current Hobart Rivulet Path (The LIST) in relation to the site plus the distance to the centre of the manmade channel.

2.8 Previous Environmental Site Investigations

2.8.1 Scherzic (2015)

The PESA scope of works included the following:

- A review of historical photos, and titles search, dangerous goods records and council consultation
- Site inspection/walkover; and
- A limited laboratory non-compliant soil investigation of soil collected from site geotechnical boreholes.

The investigation broke the site up into different areas of past activities. Although no contamination could be identified from the assessment, the assessment has been useful in generating a preliminary site conceptual model. Identified areas of historical activities are presented in Figure 7.

2.8.2 GES (2016)

Version 1 of this report was written in April 2016. As identified in the Document Control section of this report, the GES 2016 document and subsequent versions have been incorporated into this document.

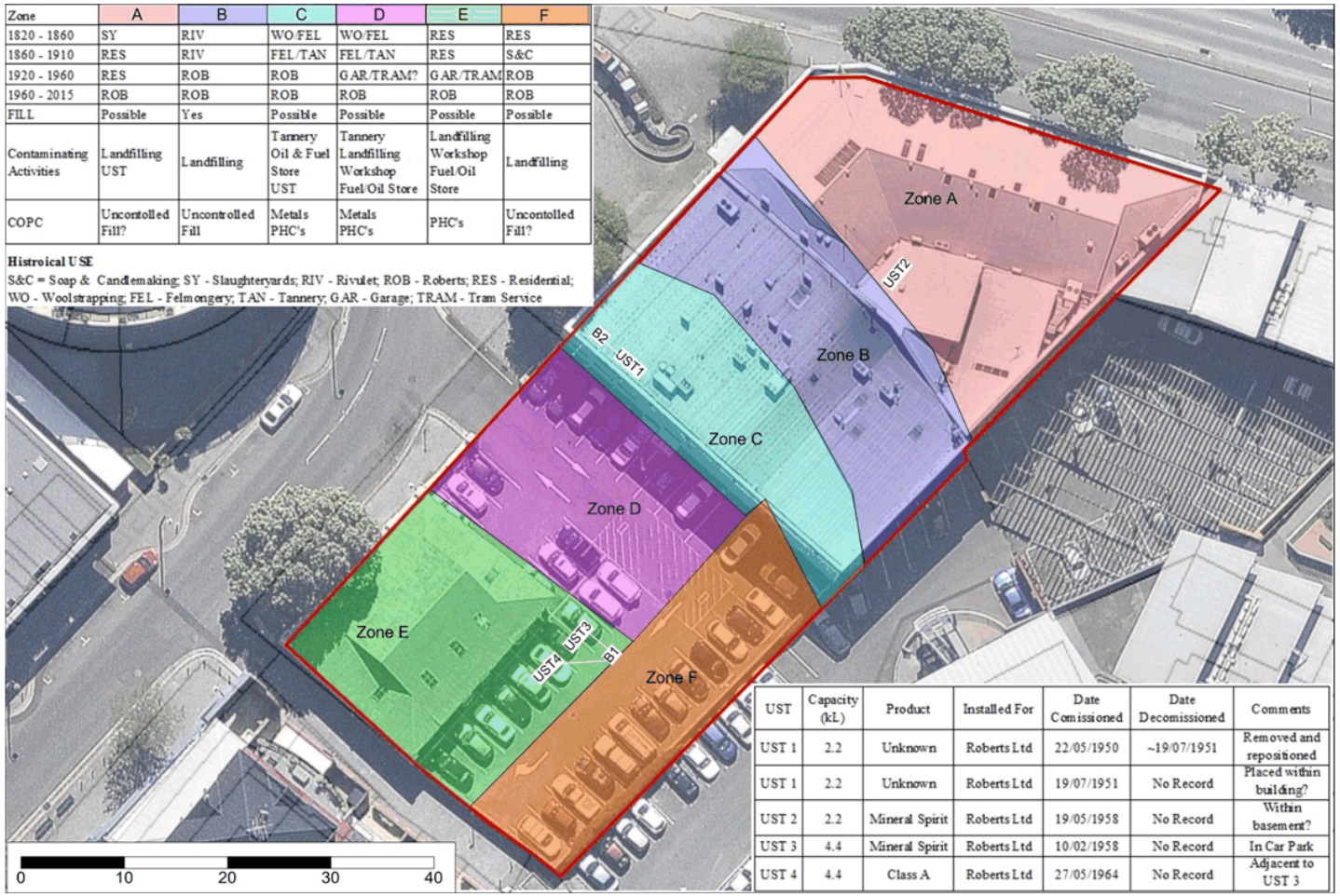
2.9 Site Topography

Most of the site is near flat and lies within the 3 to 4m contour. Parts of Zone A ramp down from these typical elevations. In general, the site is below the level of the highway. The site is fully paved and it is expected the storm water is channeled directly towards Victoria Dock.

See Figure 8 for accurate heights of the site and inferred groundwater flow direction.

Zone	A	B	C	D	E	F
1820 - 1860	SY	RIV	WO/FEL	WO/FEL	RES	RES
1860 - 1910	RES	RIV	FEL/TAN	FEL/TAN	RES	S&C
1920 - 1960	RES	ROB	ROB	GAR/TRAM?	GAR/TRAM	ROB
1960 - 2015	ROB	ROB	ROB	ROB	ROB	ROB
FILL	Possible	Yes	Possible	Possible	Possible	Possible
Contaminating Activities	Landfilling UST	Landfilling	Tannery Oil & Fuel Store UST	Tannery Landfilling Workshop Fuel/Oil Store	Landfilling Workshop Fuel/Oil Store	Landfilling
COPC	Uncontolled Fill?	Uncontrolled Fill	Metals PHC's	Metals PHC's	PHC's	Uncontolled Fill?

Histroical USE
S&C = Soap & Candlemaking; SY - Slaughteryards; RIV - Rivulet; ROB - Roberts; RES - Residential; WO - Woolstrapping; FEL - Felmongery; TAN - Tannery; GAR - Garage; TRAM - Tram Service



UST	Capacity (kL)	Product	Installed For	Date Comissioned	Date Decomissioned	Comments
UST 1	2.2	Unknown	Roberts Ltd	22/05/1950	~19/07/1951	Removed and repositioned
UST 1	2.2	Unknown	Roberts Ltd	19/07/1951	No Record	Placed within building?
UST 2	2.2	Mineral Spirit	Roberts Ltd	19/05/1958	No Record	Within basement?
UST 3	4.4	Mineral Spirit	Roberts Ltd	10/02/1958	No Record	In Car Park
UST 4	4.4	Class A	Roberts Ltd	27/05/1964	No Record	Adjacent to UST 3

Figure 7 Areas and Contaminants of Potential Concern Based on Site History

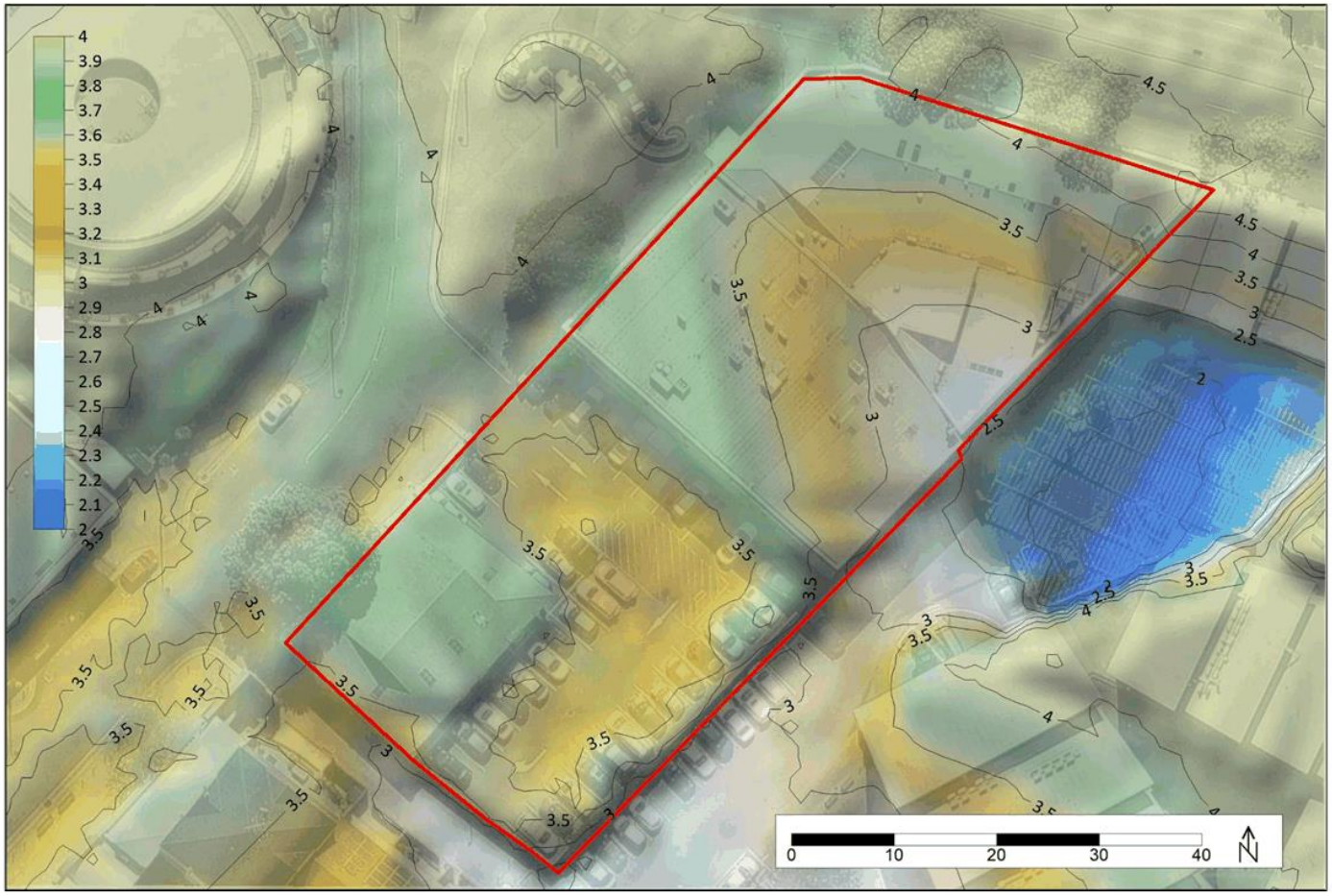


Figure 8 Height Elevations across the site, Mt. Wellington LIDAR 2010 (m AHD)

2.10 MRT Geology Mapping

The geology of the site has been mapped by Mineral Resources Tasmania, see Figure 9. The site is inferred to be underlain with:

- Quaternary undifferentiated bay, estuarine, deltaic and alluvial deposits of sand, shelly sand, pebbly sand, pebble to boulder size gravels, clayey sand, silt and clay beneath Zones D, E & F (Qi);
- Quaternary alluvial gravel, sand and clay beneath Zone A; and
- Manmade deposits (uncontrolled fill) within the former Hobart Town Rivulet (Zone B) as well as over the top of the former tannery within Zone C.

Manmade deposits infilled into the former water race to the north of the site are not included in the MRT mapping.

The findings indicate that natural ground has the potential to be shallow beneath Zones A, D, E, & F.

2.11 Areas of Potential Concern

The following information has been drawn from the PESA completed in 2015 (Scheric 2015). Refer back to the areas of potential concern in Figure 7. There is evidence for potentially multiple contaminant types at the site which include:

- 1860 to 1910 tanning operations within Zone's C and D;
- Backfilling of the Hobart Town Rivulet (Zone B) within the 1920's (probably uncontrolled);
- Potential fuel and oil storage in Zones D and E in the 1920's to the 1960's within the garage and tram service areas;
- Potential land reclamation and elevation of ground levels following each phase of site redevelopment;
- Post 1950's, when the land was owned by Roberts Ltd there were:
    - a single UST (UST 1) and bowser indoors within Zone C;
    - a single UST (UST 2) which is positioned on a stand within Zone A basement; and
    - two underground storage tanks (UST 3 & UST 4) and a single bowser present within Zone E.

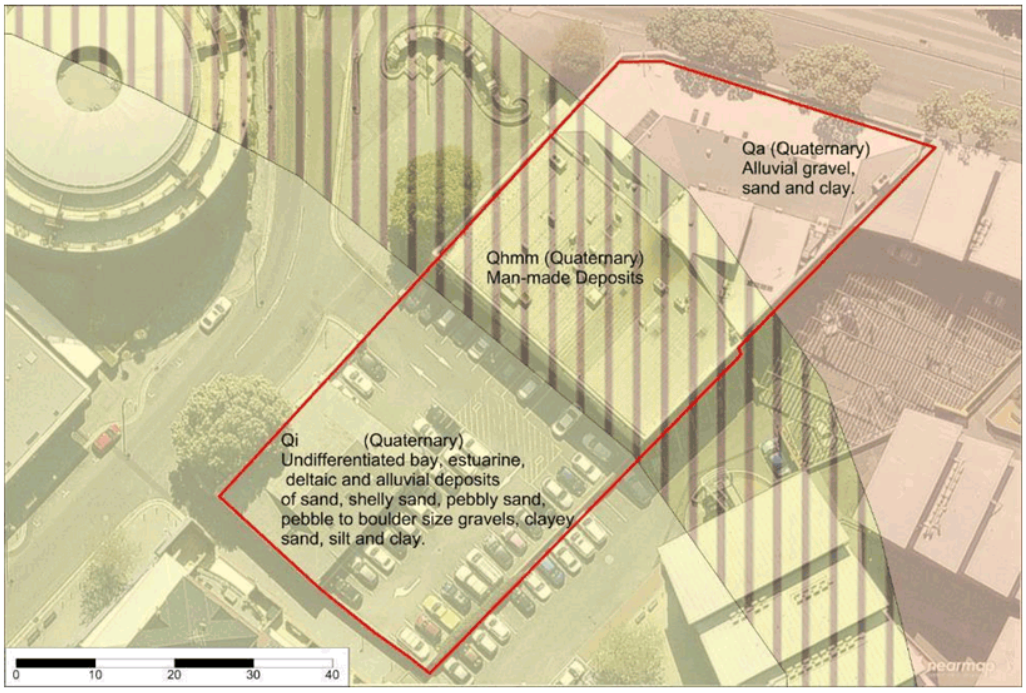


Figure 9 Local Geology

There is the potential for both soil and groundwater at the site associated with the UST's. Soil impact may have also occurred because of the use of uncontrolled fill, the use of heavy metals in tanning operations and the leaching of contaminants from the tram service area and associated workshop.

Chromium tanning processes were not discovered until approximately the same time the site tannery was decommissioned.

Types of contaminants that may be found in uncontrolled fill around Wapping area include hydrocarbons from coal waste (polynuclear aromatic hydrocarbons (PAH) compounds).

2.12 Contaminants of Potential Concern

Contamination from the site source from underground fuel storage and dispensing infrastructure. COPC include the following:

- Total Petroleum/Recoverable Hydrocarbons (TPH/TRH) sourcing from UST's and associated infrastructure;
- Mono Aromatic hydrocarbons: Benzene, Toluene, Ethylbenzene, Xylene (BTEX) potentially from UST's and associated infrastructure;
- PAH are identified in the general area (in both fill and natural soils) because of historical land use practices; and
- Heavy metals within fill.

3 FIELD INVESTIGATION PROCEDURES

Site investigation works are summarised in Table 2 and Figure 10. The soil investigation was completed in three stages, which explains the Testhole (TH) and borehole (BH) prefix. Groundwater monitoring well 7716-3 was gauged but not sampled on the 15/03/2016 due to a well obstruction. Groundwater monitoring well 7716-1 was not gauged or sampled on the 7/08/2017 due to a well obstruction.

Table 2 Summary of Site Investigation Works

Hole ID	Soil Bore Drill & Sample	Well Install	Survey	Develop Wells	Slug Test	Well Gauge#	Well Purge & Sample
TH01 to TH06 & BH07	15/03/16	NA	NA	NA	NA	NA	NA
BH08 to BH13	16/03/16	NA	NA	NA	NA	NA	NA
BH14 to BH22	4/08/17	NA	NA	NA	NA	NA	NA
7716-3	NA	NA[1]	NA	NA[1]	NA	15/03/16	NA
7716-1 & 77165-2 7716-4 & 77165-5	NA	NA[1]	NA	NA[1]	NA	15/03/16	15/03/16
7716-1	NA	NA	NA	NA	NA	NA	NA
7716-2 & 77165-5	NA	NA	NA	NA	NA	7/08/17	7/08/17

NC – Not Conducted – Hydraulic conductivity estimates are made based on soil classification
NA – Not Applicable – Only two wells installed. Reliance of hydraulic gradient inferences.
1 Groundwater wells were installed under the supervision of Scherzic between the 17th November 2014 to the 20th November 2014. It is presumed that groundwater monitoring wells were installed as per Minimum Construction Requirements for Water Bores in Australia (MCRWBA 2011) and AS5667.11 (1998).

3.1 Soil Investigation

3.1.1 Borehole Drilling

At each of the bore locations, the following precautions were put in place to avoid disrupting underground service assets:

- Dial Before You Dig plans were obtained;
- Archers Underground Service were engaged; and
- Where practical, the first meter of the bore was cleared with a hand auger.

Concrete coring was undertaken through bitumen or concrete at each drilling location as required.

A total of twenty-two (22) 65 mm diameter soil bores were drilled for assessing site geology and sampling for contamination impact (Figure 10). The bores were drilled by GES using a hand auger and or the industry recognized Geoprobe direct push drilling system. The selected drilling method involved using a Geoprobe dual tube to retain wall integrity and eliminates risk of profile collapse whilst allowing extraction of 1.0 m length sample cores and allows for deployment of pre-packed well systems.

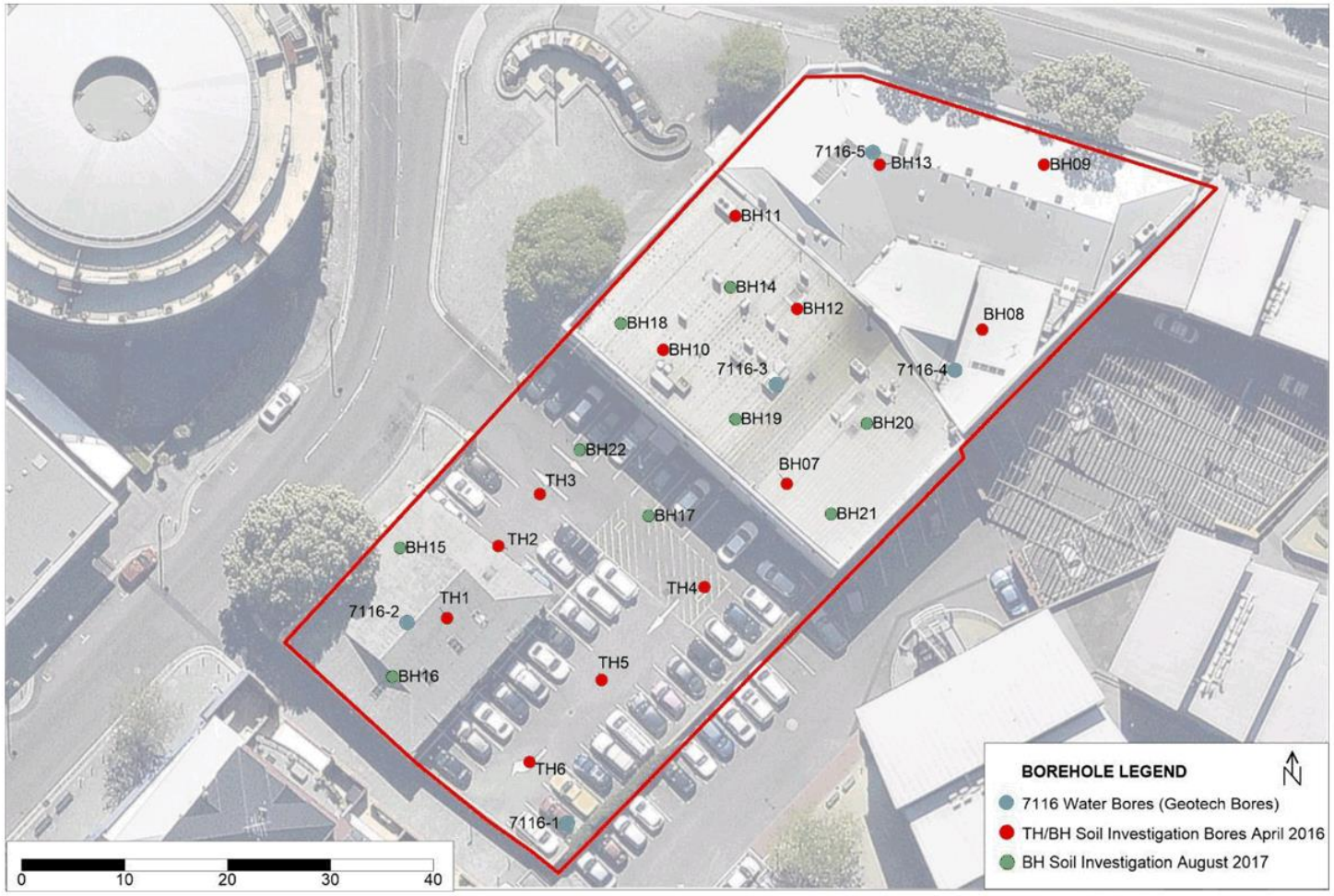


Figure 10 Borehole and Groundwater Monitoring Well locations

3.1.2 Soil Sampling

Soil sampling was conducted according to the National Environmental Protection Measure (NEPM 2013) and AS4482 sampling guidelines. Table 3 presents a summary of the soil assessment methodology adopted at the site.

Table 3 Summary of Soil Sampling Methods

Activity	Details / Comments
Soil Logging	Samples were extracted from the direct push liner for analysis. Logging the soil was conducted in accordance with the Unified Soil Classification System (USCS) as detailed in AS1726 (1993).
Decontamination of Sampling Equipment	Quantum Clean Laboratory Detergent (R213) was used to decontaminate reusable sampling equipment.
Soil Screening	Individual soil samples were collected from the core tray at 0.5 to 1.0 m intervals below ground surface (bgs) and/or change in geology. Collected samples were screened for volatile fractions using a Photoionisation Detector (PID). This was done by placing the samples within snap lock bags and analysing the headspace with a PID probe.
Soil Sample Collection	Samples were selected for laboratory analysis: • where PID values exceeded a nominated value suitable for COPC's • in the case where hydrocarbons were not detected in individual bores using the PID, select samples were collected from representative horizons and submitted for analysis. A minimum number of samples were carefully selected which would provide sufficient information to delineate hydrocarbon contamination in soils.
Sample preservation	Samples were placed into a jar for laboratory analysis. Soil jars were placed in a pre-chilled cool box with ice bricks.
Sample holding times	Sample holding times were within acceptable range (based on NEPM B3-2013) from collection to extraction.

3.1.3 Soil Analysis

Primary and Quality Control (QC) samples (excluding triplicates) were submitted to Analytical Laboratory Services (ALS) for analysis. Of the 60 primary samples collected in March 2016, 30 were selected for analysis and 30 were put on hold. Of the 25 primary samples collected in August 2017, 17 were selected for analysis and 8 were put on hold Chain of Custody (COC) documentation was completed and is provided in Appendix 2. Table 4 presents a summary of the laboratory analyses undertaken.

Table 4 Overview of Soil Analysis and Quality Control (March 2016 and August 2017)

Analytes	Primary Soil Samples	Duplicates[a]	Triplicate[b]	Rinse Blank[c]	Field Blank[d]
TPH/TRH	47	5	-	3	-
BTEX	47	5	-	3	-
PAH	47	5	-	3	-
15 Metals	47	5	-	-	-
OC/OP Pesticides	1	-	-	-	-

Sampling Quality Control Standards (AS4482):
a – One (1) in twenty (20) intra laboratory split (duplicate) samples
b - One (1) in twenty (20) inter laboratory split (triplicate) samples
c - Single rinse sample per piece of equipment per day
d - Single field blank per day.

The requirement for testing samples for soil physicochemical properties for obtaining threshold environmental investigation limits is presented in

Table 5. The potential requirement for soil physicochemical testing is summarised:

- Lead – no requirement
- Naphthalene – No requirement

Table 5 Summary of Soil and Physicochemical Properties Required for Development of Ecological Investigation Levels - EIL's (NEPM 2013)

Compound	Cation Exchange Capacity	pH	% Clay
Zinc	Required		NR
Copper	Required	NR	
Chromium III	NR		Required
Nickel	Required	NR	
Lead	NA		
Arsenic	NA		
DDT	NA		
Naphthalene	NA		

NR - Soil physicochemical parameter not required to develop threshold investigation limit for compound
NA – Investigation limits dependent on land use scenarios rather than soil physicochemical properties

Given that a full 15 metal suite was analysed, there was requirement to assess the following soil physical properties:

- % Clay content;
- Cation exchange capacity; and
- Soil pH

The soil physical properties were assessed through estimation and chemical properties were based on knowledge of similar soil types encountered around Hobart.

3.2 Groundwater Assessment

3.2.1 Monitoring Well Establishment and Testing

Groundwater wells were installed by KMR under the supervision of Scherzic on the 17th November 2014 to the 20th November 2014, see Figure 10. There are no records of slug testing or development.

3.2.2 Monitoring Well Gauging and Sampling

Table 6 summarises wells that were gauged and sampled at the site at the site.

Table 6 Summary of Monitoring Well Gauging and Sampling Procedures

Activity	Procedure Details
Groundwater Gauging	All groundwater wells were gauged for standing water levels (SWL) from top of casing (TOC) and the presence of Phase Separated Hydrocarbons (PSH) using a Solinst water/oil/air Interface Probe (IP).
Groundwater Extraction Method	Groundwater was extracted from the well using one of the following: • Geoprobe peristaltic pump in cases where the well is shallower than 7 m; or a • Waterra valve in cases where the well is deeper than 7 m.
Groundwater Purging	To ensure a representative groundwater sample could be collected, groundwater was purged three (3) times the volume of the well (6 x water column) or purged dry using the chosen groundwater extraction method for well development. The following physiochemical parameters (PCP's) were monitored whilst purging to ensure that the aquifer and groundwater parameters had stabilised to within 10% variation of the previous reading: • Reduction / Oxidation potential (REDOX); • Temperature; • pH; and • Electrical conductivity (EC).
Decontamination Procedure	Dedicated tubing was used at each monitoring well. All reusable equipment (IP) was decontaminated using Quantum Clean Laboratory Detergent (R213) and deionized water between each monitoring event.
Sample preservation	Following groundwater purging, all groundwater samples were collected in laboratory supplied receptacles, labelled, chilled, and delivered with a COC to National Association of Testing Authorities (NATA) certified laboratories for analysis within the prescribed holding time.
Sample holding times	Sample holding times were within acceptable range (based on NEPM B3-2013) from collection to extraction.

3.2.3 Groundwater Analysis

Primary and QC samples (excluding triplicates) were submitted to Analytical Laboratory Services (ALS) for analysis. Table 7 presents a summary of the sample analysis including the QC sampling based on AS5667.1 and AS5667.11.

Table 7 Overview of Groundwater Analysis and Quality Control

Analytes	Primary Groundwater Samples	Duplicates[a]	Triplicate[b]	Rinse Blank[c]	Field Blank[d]	Trip Blank[e]
TPH/TRH	4	1	-	1	-	1
BTEX	4	1	-	1	-	1
PAH	4	1	-	1	-	1
15 Metals	4	1	-	1	-	1

a – One (1) in ten (10) intra laboratory split (duplicate) samples
b - One (1) in ten (10) inter laboratory split (triplicate) sample
c - Single rinse sample per piece of equipment per day
d - Single field blank per day.
e – One per esky (applicable to the August 2017 event only)

4 QUALITY CONTROL

Field and laboratory quality control results are presented in Appendix 3.

4.1 Field

It is standard to expect up to 10% error in field duplication and up to 10% laboratory error. Therefore, in theory up to 20% error can be assumed on duplicate analysis. Some variation may exist in soil and groundwater because even though all efforts are made to split samples homogeneously, fragments of materials may bias samples in certain elements.

Relative Percentage Differences (RPDs) for the duplicate and triplicate samples where applicable are calculated using the method outlined below.

The acceptance criteria used for the RPDs depend on the levels of contaminants detected and the laboratory's Method Detection Limits. The closer the levels detected are to the MDL the greater the acceptable RPD.

- RPDs are calculated as follows:
- RPD <50% for low level results (<20 * MDL)
- RPD <30% for medium level results (20-100 * MDL)
- RPD <15% for high level results (>100 * MDL)
- No limit applies at <2 * MDL (Method Detection Limit)

Field QA/QC procedures and compliance are summarised in Table 8 and Table 9.

Table 8 Field QA/QC Procedures and Compliance for the Soil Investigations (March 2016 & August 2017)

QA/QC Requirement	Completed	Comments
Appropriate sampling strategy used and representative samples collected	Yes	Sampling program was undertaken in accordance with AS4482.1-2005
Field instruments calibrated	Yes	Certificates Provided Appendix 4
Appropriate and well documented sample collection, handling, logging, transportation and decontamination procedures.	Yes	None
Chain-of-custody documentation completed	Yes	All samples were transported under strict COC procedures and signed COC documents are included in this report.
Required number of duplicate samples collected (1:20)	Yes	Soil - 47 Primary samples and 5 Dups
QA/QC samples reported method detection limits within indicated guidelines.	Yes	All soil analytes comply with MDL method.
Required numbers of field and rinse blank samples collected	Rinsate only	Two rinsate blank collected as per AS4482.1-2005
Acceptable field and rinse blank samples collected	Yes	All results were below laboratory limit of reporting.
Samples delivered to the laboratory within sample holding times and with correct preservative	Yes	All samples were sent to the laboratory within holding times and correct preservative.

Table 9 Field QA/QC Procedures and Compliance for the Groundwater Investigations (March 2016 & August 2017)

QA/QC Requirement	Completed	Comments
Appropriate sampling strategy used and representative samples collected	Yes	Sampling program was undertaken in accordance with AS4482.1-2005
Field instruments calibrated	Yes	Certificates Provided Appendix 4
Appropriate and well documented sample collection, handling, logging, transportation and decontamination procedures.	Yes	None
Chain-of-custody documentation completed	Yes	All samples were transported under strict COC procedures and signed COC documents are included in this report.
Required number of duplicate samples collected (1:20)	Yes	Groundwater – 8 Primary Samples and 2 Dups
QA/QC samples reported method detection limits within indicated guidelines.	Yes	All groundwater analytes comply with MDL method.
Required numbers of field and rinse blank samples collected	Rinsate only	Two rinsate blank collected as per AS4482.1-2005
Acceptable field and rinse blank samples collected	Yes	All results were below laboratory limit of reporting.
Samples delivered to the laboratory within sample holding times and with correct preservative	Yes	All samples were sent to the laboratory within holding times and correct preservative.

4.2 Laboratory

Laboratory QA/QC procedures and compliance are summarised in Table 10 and Table 11.

Table 10 Laboratory QA/QC Procedures and Compliance for the Soil Investigations (March 2016 & August 2017)

QA/QC Requirement	Compliance	Comments March 2016	Comments August 2017
All analyses NATA accredited	Yes		
Appropriate analytical methods used, in accordance with Schedule B(3) of the NEPM	Yes		
Acceptable laboratory limits of reporting (LORs) adopted.	Yes		
Method Blanks: zero to <Practical Quantitation Limit (PQL)	Yes	OK	OK
Duplicate Samples:<30% to 50% RPD.	No	OK	BH14 0.5-0.6 Phenanthrene and Anonymous sample Mercury exceeds LOR based limits
Laboratory Control Samples: 70% to 130% recovery for soil; or 80% to 120% recovery for waters;	Yes	OK	OK
Matrix spikes: 70% to 130% recovery for organics or 80%-120% recovery for inorganics	No	PAH – Pyrene TH01 4.2-4.5 MS recovery not determined, background level greater than or equal to 4x spike level	Anonymous sample for Lead – MS recovery not determined, background level greater than or equal to 4x spike level Total Mercury (Actual 4.75, expected 5.00) outside NEPM 2013 B3 & ALS QC Standard
Surrogates: 70% to 130% recovery	No	BH11 0.4-0.5: 2-Chlorophenol-D4 and 2.4.6 Tribromophenol; BH10 3.4-6-3.5: 2-Fluorobiphenyl for all samples recovery was less than lower data quality objective.	OK
Analysis holding time outliers	Yes	OK	OK
Quality Control Sample Frequency Outliers	No	TRH Semivolatile Fraction (Actual 9.72; Expected 10.00) outside NEPM 2013 B3 & ALS QC Standard	OK

Table 11 Laboratory QA/QC Procedures and Compliance for the Groundwater Investigations (March 2016 & August 2017)

QA/QC Requirement	Compliance	Comments March 2016	Comments August 2017
All analyses NATA accredited	Yes		
Appropriate analytical methods used, in accordance with Schedule B(3) of the NEPM	Yes		
Acceptable laboratory limits of reporting (LORs) adopted.	Yes		
Method Blanks: zero to <Practical Quantitation Limit (PQL)	Yes	OK	OK
Duplicate Samples:0% to 20% RPD.	No	OK	PAH/Phenols (Actual 0.0; Expected 10.00) TRH – Semivolatile (Actual 0.0; Expected 10.00) outside NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples: 70% to 130% recovery for soil; or 80% to 120% recovery for waters;	Yes	OK	OK
Matrix spikes: 70% to 130% recovery for organics or 80%-120% recovery for inorganics	No	OK	PAH/Phenols (Actual 0.0; Expected 5.00) TRH – Semivolatile (Actual 0.0; Expected 5.00) outside NEPM 2013 B3 & ALS QC Standard
Surrogates: 70% to 130% recovery	Yes	OK	OK
Analysis holding time outliers	Yes	OK	OK
Quality Control Sample Frequency Outliers	Yes	PAH/Phenols (Actual 7.69; Expected 10.00) TRH – Semivolatile (Actual 0.0; Expected 5.00) outside NEPM 2013 B3 & ALS QC Standard	OK

5 FIELD INVESTIGATION FINDINGS

5.1 Soil

5.1.1 Geological Interpretation

The geology of the site is summarised in Table 12 and Table 13. Borehole logs are presented in Appendix 5. The site lithology is highly varied and comprises of predominantly clay, sand and gravel with some silt. All investigation bores intercepted predominantly fill material which has a very similar composition to the MRT mapped geology, indicating that it may have been locally reworked.

Table 12 Generalised Stratigraphy at the Site TH01-BH13, March 2016

	Bitumen	Concrete	Fill	Fill Composition	Natural Sediments	Natural Composition	Comments
TH01	0 - 0.03	0.03 -0.4	0 - 3.0	GRAVEL, CLAY, & SAND	3.0 - 4.5	Silty CLAY & Sandy SILT	
TH02	0 - 0.03	0.03 -0.4	0 - 0.9	Clayey SAND			Refusal
TH03	0 - 0.05		0 - 2.5	GRAVEL, CLAY, & SAND	2.5 - 3.6	Sandy SILT & Silty CLAY	
TH04	0 - 0.05		0 - 1.2	Sandy GRAVEL & Clayey SAND	1.2 - 3.6	Clayey SAND & Sandy SILT	Core Loss in Fill
TH05	0 - 0.05	0.8 - 0.9	0 - 0.9	Sandy GRAVEL & Concrete	0.9 - 4.6	Clayey SAND & Sandy SILT	
TH06	0 - 0.05		0 - 2.5	Sandy GRAVEL & Clayey SAND	2.5 - 4.6	Clayey SILT	Saturated at 3.6
BH07		0 - 0.35	0 - 3.0	Sandy GRAVEL & Clayey SAND	3.0 - 3.6	Clayey SILT	Saturated at 3.4
BH08		0 - 0.13	0 - 3.0	GRAVEL, CLAY, & SAND			
BH09		0 - 0.25	0 - 0.6				Refusal on gravels
BH10		0 - 0.35	0 - 3.3	CLAY & SAND	3.3 - 4.6	Clayey SILT & Silty CLAY	
BH11		0 - 0.35	0 - 3.0	CLAY & SAND			
BH12		0 - 0.2	0 - 3.3	SAND, CLAY & GRAVEL			
BH13		0 - 0.25	0 - 1.1	CLAY & SAND			Refusal on boulder

Table 13 Generalised Stratigraphy at the Site TH01-BH13, August 2017

BH ID	Bitumen	Concrete	Fill	Fill Composition	Natural Sediments	Comments
BH14		0-0.25	0.25-3.0	Sandy CLAY and Sandy GRAVEL	Not Encountered	
BH15		0-0.20	0.2-3.0	Mixed Sand/Clay/Gravel; Sandy GRAVEL; Clayey SAND; Sandy CLAY	"	
BH16	0-0.05	0.05-0.2	0.2-3.0	Gravelly Clayey SAND; Sandy GRAVEL; Sandy CLAY	"	
BH17	0-0.1		0.1-3.0	Sandy GRAVEL; Gravelly Clayey SAND; Sandy Silty CLAY	"	
BH18		0.0-0.4	0.4-2.2	Gravelly Clayey SAND; Silty Sandy CLAY	"	Refusal at 2.2
BH19		0.0-0.45	0.45-3.0	Gravelly Clayey SAND; Sandy GRAVEL; Sandy CLAY;	"	
BH20		0.0-0.45	0.45-3.0	Gravelly Clayey SAND; Sandy CLAY;	"	
BH21		0.0-0.4	0.4-3.0	Gravelly Clayey SAND; Gravelly Sandy CLAY	"	
BH22	0.01		0.01-0.9	Sandy GRAVEL; Gravelly Clayey SAND;	"	Refusal at 0.9

5.1.2 Soil Contamination Observations

Soil samples selected for hydrocarbon analyses were based on olfactory observations. Photo Ionisation Detector (PID) was used to assess soil contamination on site. All samples from the March 2016 assessment returned a value of 0.0ppm except for two samples from BH10 which recorded the following;

- 43ppm (parts per million) from 2.1m below ground surface (bgs); and
- 121ppm from 3.4m bgs

The samples from the August 2017 assessment returned a value of 0.1-2.3ppm.

5.2 Groundwater

5.2.1 Borehole Hydrogeology & Well Construction

Table 14 presents a summary of the groundwater monitoring well construction details for all wells at the site.

Details of the specific well install have not been made available to GES. GES have made assumptions about the screened intervals by indicating that the measured well depth is the base of the screened interval and the top of screened interval is roughly 1.5 m bgs as indicated in the text although this has not been confirmed. There is therefore an assumption that the wells have been correctly installed with the top of well screen at the depth water was struck (DWS) in a confined setting and above the DWS in an unconfined setting. If this assumption is correct and there is light non-aqueous phase liquids (LNAPL) within the groundwater, then this would be gauged during the Groundwater Monitoring Event (GME).

Table 14 Summary of Well Construction and Aquifer Details (depths m bgs)

Well	Date Installed	DWS (m)	Top of Screen (m)	Bottom of Screen (m)	Aquifer Lithology at DWS*	Confined/ Unconfined
7116-1	17/11/2014	2.9^	1.5	5.49	SAND Fill	Unconfined
7116-2	18/11/2014	3.2	1.5	3.48	SAND	Locally Confined
7116-3	19/11/2014	2.8 & 3.7	1.5	3.93	SAND & CLAY	Locally Confined
7116-4	19/11/2014	2.6^	1.5	6.31	DOLERITE	Locally Confined
7116-5	20/11/2014	3.2^	1.5	6.4	DOLERITE	Locally Confined

DWS - Depth Water Struck
^ Estimated from SWL and assumes an unconfined aquifer

5.2.2 Hydraulic Gradient and Groundwater Flow Direction

Field results from the groundwater gauging are presented in Appendix 6. Given the site was active, a vehicle obstructing 7116-1 meant that gauging and water quality information could not be collected.

Groundwater depths for the gauging events, March 2016 and August 2017 are presented in Table 15 . Top of casing elevations have been inferred based on the PDA survey, and an assumption is made that all wells are installed at a consistent depth, m bgs. Survey information is not available for 7116-4 which is installed on the lower level within the building and therefore this data is not included for groundwater contouring. Phase Separated Hydrocarbons (PSH) was not detected (gauged) in any of the monitoring wells during either monitoring event. Groundwater levels from the March 2016 event have been contoured in Figure 11. The August 2017 event has not been contoured given missing gauging data from 7116-2 and survey data from 7116-4.

Table 15 Summary of Groundwater Gauging Results, April 2016 and August 2017

Monitoring Well	7116-01	7116-02	7116-03	7116-04	7116-05
Well Depth (m)	5.49	3.48	3.93	6.31	6.40
Top of Casing (TOC) Height (m AHD)	3.500	3.600	3.740	?	3.740
Groundwater Gauging Date	15 March 2016				
Groundwater Depth from TOC (m) 15 Mar 16	2.910	3.136	3.292	2.630	3.203
PSH Thickness (mm)	0	0	0	0	0
Corrected Groundwater Elevation (m AHD) 15 Mar 16	0.590	0.464	0.448	?	0.537
Groundwater Gauging Date	7 August 2017				
Groundwater Depth from TOC (m) 7 Aug 17	-	2.711	2.820	2.937	2.110
PSH Thickness (mm)	-	0	0	0	0
Corrected Groundwater Elevation (m AHD) 7 Aug 17	-	0.889	0.920	?	1.630

\- *Data not collected*
? *TOC unknown, unable to calculate corrected groundwater elevation*

Results from the March 2016 assessment indicate that the groundwater flow direction is inferred to be radial towards 7116-03 which is screened within the sand and clay fill to the side of the former Hobart Town Rivulet. Groundwater flows to the north in zones D, E & F and to the southwest in zones A and B. The hydraulic gradient is determined to be approximately 0.4% towards the former Hobart Town Rivulet from the southern parts of the site and 0.3% towards the former Hobart Town Rivulet from the northern parts of the site (Table 16).

Table 16 Summary of Inferred Site Groundwater Flow Directions and Rates

Details	Zone A & B	Zone D to F
Groundwater flow direction from the site	Southwest	North
Hydraulic Gradient Calculations Up gradient Groundwater Elevation Downgradient Groundwater Elevation Distance Between Points Hydraulic Gradient	 0.550 m AHD 0.475 m AHD ~25 m 0.3 % (very shallow)	 0.525 m AHD 0.475 m AHD ~13 m 0.4 % (very shallow)

There is a possibility that groundwater may be migrating along the old rivulet sediments towards the new Hobart Rivulet alignment. Given a 1 m column thickness and a 10 m channel width, flow into the channel would range from 0.15 to 0.8 cubic meters per day (1.5 to 10 ml per second). If the site surfaces are removed, the groundwater gradient has the potential to steepen by 10-fold through mounding (3 to 4%).

In the context of any potential contaminant mass loading into the Hobart Rivulet. Existing groundwater flow rates are a significant magnitude lower in the order of milliliters per second compared with several cubic meters per second. Contaminant concentration threshold exceedances must be greater than 1,000,000 for mass loading equivalents to be detected within the Hobart Rivulet environment based on current setting and 10,000 magnitudes based on site excavation conditions.

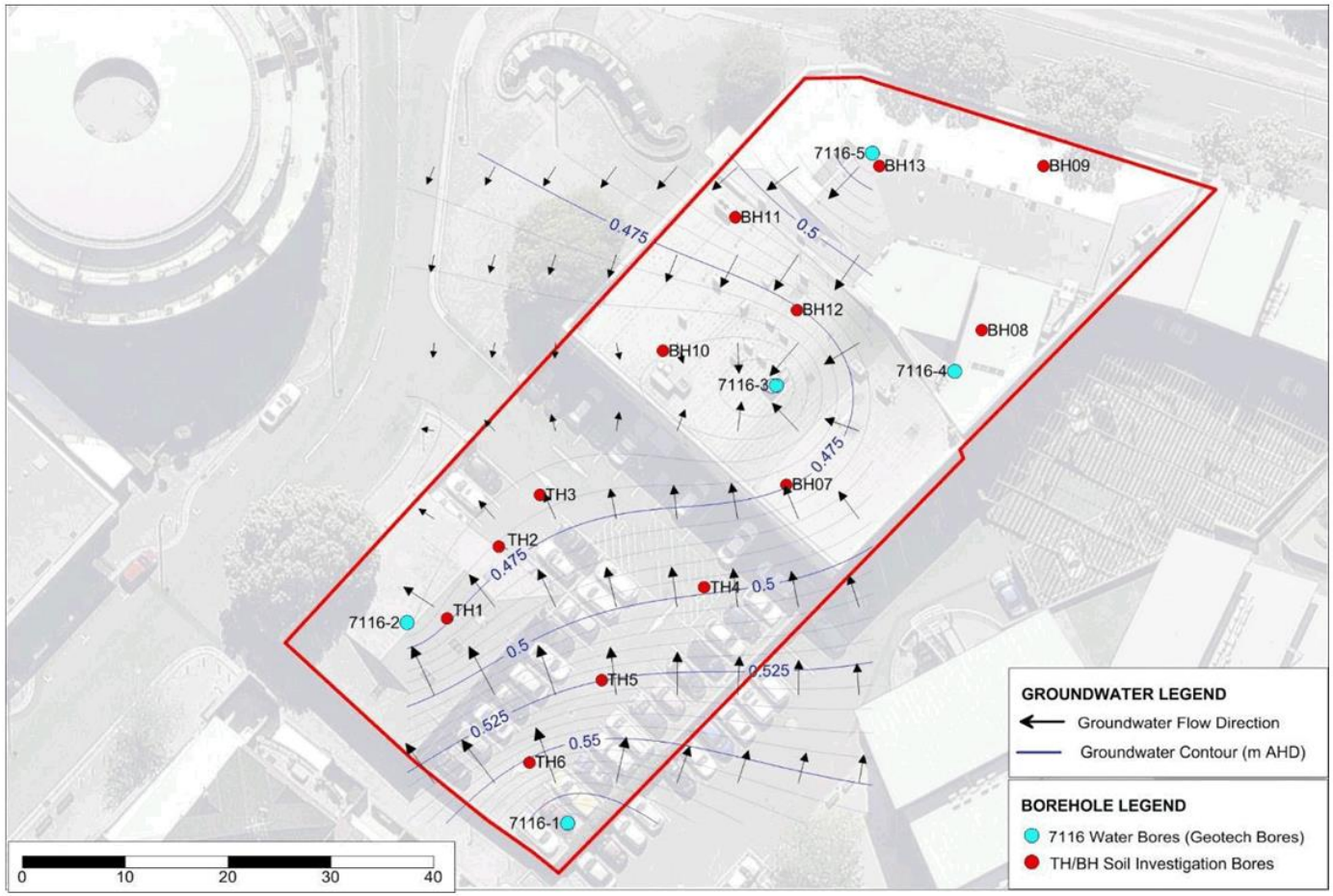


Figure 11 Groundwater Flow Direction, April 2016 Assessment

5.2.3 Hydraulic Conductivity

Slug testing has not been conducted in aquifers at the site and inferences are made about the aquifer material hydraulic properties. The aquifer is inferred to comprise of a *medium grained clean sand* which would have a hydraulic conductivity in the order of *1 to 5 m per day* (Freeze & Cherry 1979).

5.2.4 Groundwater Flow Rates

Groundwater flow rates are in the order of 5 to 22 m per year for zones A & B and 6 to 29 m per year for Zones D to F based on hydraulic calculations presented in Table 17. Groundwater flow rates relatively slow.

Table 17 Summary of Inferred Groundwater Flow Rates at the Site

Applicable Areas	Hydraulic Conductivity (m/year)	Hydraulic Gradient	Effective Porosity	Flow rate (m/year)
	K	i_h	δ	(K x i_h) / δ
Zone A & B	365 to 1825	0.003 (0.3%)	0.25	5 to 22
Zone D to F	365 to 1825	0.004 (0.4%)	0.25	6 to 29

5.2.5 Groundwater Physiochemistry

For both groundwater monitoring events, all purge volumes were attained or the wells were pumped to three times the well volume or dry (which ever sooner) before collecting a representative sample for physiochemical analysis and laboratory analysis. Physiochemical parameters were collected whilst purging and a representative value for the aquifer is presented in Table 18 and Table 19.

The following observations were made during the April 2016 groundwater sampling:

- Groundwater well 7116-04 was purged dry.
- Groundwater extracted from 7116-02 was turbid.

The following observations were made during the August 2017 groundwater sampling:

- The following groundwater wells 7116-04 and 7116-05 were purged dry.

Table 18 Summary of Stabilised Groundwater Properties, March 2016

Parameter	Range	Average	Comment
Temp (°C)	14.8 (7116-02) to 16.9 (7116-01)	16.4	Typical temperature for groundwater within southern Tasmania
pH	6.67 (7116-01) to 7.51 (7116-05)	7.2	Indicates near neutral pH conditions for groundwater
Redox (mV)	-23 (7116-01) to 210 (7116-04)	103.9	Indicates that oxidising conditions exist beneath the site
EC (µs/cm)	1281 (7116-05) to 5510 (7116-02)	2687.2	Indicates moderate to low quality groundwater

Table 19 Summary of Stabilised Groundwater Properties, August 2017

Parameter	Range	Average	Comment
Temp (°C)	13.4 (7116-05) to 14.4 (7116-04)	13.8	Typical temperature for groundwater within southern Tasmania
pH	6.92 (7116-02) to 7.74 (7116-04)	7.3	Indicates slightly alkaline pH conditions for groundwater
Redox (mV)	-0.9 (7116-02) to 240.1 (7116-05)	142.3	Indicates that oxidising conditions exist beneath the site
EC (µs/cm)	5.06 (7116-02) to 2095 (7116-03)	1284.3	Indicates moderate to low quality groundwater

5.2.6 PSH & Groundwater Contamination Observations

PSH was not gauged in any wells at the site.

6 SOIL ECOLOGICAL ASSESSMENT

6.1 Protected Environmental Values

The requirement for protecting soil from contaminated activities in Tasmania is managed under the Environmental Management and Pollution Control Act 1994 (EMPCA) which states in Part 5A:

(2) An area of land is a contaminated site if –

(a) there is in, on or under that area of land a pollutant in a concentration that –

(i) is above the background concentration; and

(ii) is causing or is likely to be causing serious or material environmental harm or environmental nuisance, or is likely to cause serious or material environmental harm or environmental nuisance in the future if not appropriately managed;

Potential soil impact at the site is assessed through application of the following environmental investigation guidelines.

6.2 NEPM (2013) Guidelines

The following environmental investigation guidelines are to be addressed in order to assess acceptable levels of risk to terrestrial ecosystems:

- NEPM (2013) Ecological Investigation Levels (EIL's) – have been developed for selected metal and organic substances. EIL's depend on specific soil and physicochemical properties and land use scenarios and generally apply to the top two (2) metres of the soil profile (NEPM 2013);
- NEPM (2013) Ecological Screening Levels (ESL's) – have been developed for selected petroleum hydrocarbon compounds and total petroleum hydrocarbon fractions. ESL's broadly apply to coarse and fine grained soils and various land use scenarios within the top two (2) metres of the soil profile (NEPM 2013).

Soil analytical results are compared against ESL's and EIL's limits presented in Table 20.

Table 20 Summary of Soil Investigation Limits Considered at the Site based in NEPM (2013) ASC

Investigation Levels (IL)	Analytes Investigated						
	Hydrocarbons				Metals		DDT
	BTEX	TRH (F1 to F4)	Benzo(a) pyrene (PAH)	Naphthalene (PAH)	Zn, Cu, Cr(III), Ni & As	Lead	
ESL's	Analysed	Analysed	Analysed	No Guideline	No Guideline	No Guideline	No Guideline
EIL's	No Guideline	No Guideline	No Guideline	Analysed	Analysed	Analysed	Not Analysed

6.3 Guidelines

6.3.1 Ecological Screening Levels

The following compounds were compared against NEPM (2013) ESL's:

- BTEX;
- F1 to F4 TRH; and
- Benzo(a)pyrene

Selection of ESL threshold investigation limits are set out in the NEPM (2013) guidelines and require classification of the soil according to:

- Land use sensitivity:
    - Areas of ecological significance
    - Urban residential and public open space; and
    - Commercial and industrial.

- Dominant particle size passing through a 2 mm sieve into:
    - Coarse – sand sizes and greater; and
    - Fine – clay and silt sizes.

Adopted NEPM (2013) soil and land use classifications are presented below.

6.3.2 Ecological Investigation Levels

The following compounds were compared against EIL's:

- Lead;
- Nickel;
- Chromium;
- Zinc;
- Copper;
- Arsenic; and
- Naphthalene.

There was a requirement to classify the soil according to physicochemical properties given that the above listed compounds.

Selection of EIL threshold investigation limits are set out in the NEPM (2013) guidelines and require classification of the soil according to specific soil and physicochemical properties as detailed in the field investigation procedures and the adopted land use scenarios presented in Table 21.

Table 21 Adopted Land Use Scenario for the Various Soil Bores

Land Use Scenario	Applicable Soil Bores
Areas of Ecological Significance	
Urban Residential & Public Open Space	
Commercial & Industrial	TH01 to TH06 & BH07 to BH22

6.4 Findings

6.4.1 Ecological Screening Levels

March Results 2016

The findings from the March 2016 event indicate that ESL's were not exceeded in bores within Zone A & and Zone D and parts of Zone F.

Table 22 (note this table has been amended from the comparrision of HSL B guidelines to HSL D guidelines). The following ESL exceedance were apparent at the site in the March 2016 assessment:

- Benzo(a)pyrene concentrations exceeded the threshold ESL's in the following soil samples:
  - TH01: 0.4-0.8, 2.5-2.6; 4.2-4.5;
  - TH02: 0.4-0.8;
  - TH04: 0.5-0.6;
  - BH07: 0.54-0.5;
  - BH10: 0.4-0.5, 2.1-2.2 & 3.4-3.5;
  - BH11: 0.4-0.5 & 2.7-2.8; and
  - BH12: 0.3-0.4, 1.5-1.6 & 2.9-3.0.
- F2 concentrations exceeded the threshold ESL's in the following soil samples:
  - TH01: 0.4-0.8 & 4.2-4.5; and
  - BH10: 3.4-3.5.
- F3 concentrations exceeded the threshold ESL's in the following soil samples:
  - TH01: 0.4-0.8; 4.2-4.5;
  - TH02: 0.4-0.8; and
  - BH07: 0.54-0.5;

Impact was primarily encountered in bores within (and not necessarily confined to) Zone B, C, E and the northern part of Zone F. Highest levels of contamination roughly correlate with areas where the fill is deepest.

Impact was not encountered in TH03, TH05, TH06, BH08, BH09 and BH13. The findings indicate that ESL's were not exceeded in bores within Zone A & and Zone D and parts of Zone F.

Table 22 Summary of Soil Analytical Results Compared with ESL D, March 2016

NEPM Ecological Screening Levels for Soil				Method	EP080: BTEXN					EP080/071: TRH			
Colour Shading - Indicates ESL Exceedances: >1 x, * 2-5 x, ** 5-20 x, *** 20-50 x, **** >50 x				Analysis	Benzene	Toluene	Ethylbenzene	Xylenes	Benzo(a)pyrene	F1 (C6 - C10)	F2 (>C10 - C16)	F3 (>C16 - C34)	F4 (>C34 - C40)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample ID	Sample Date	Soil Texture	Land Use	LOR	0.2	0.5	0.5	0.5	0.5	10	50	100	100
TH01 0.4-0.8m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	53.8****	<10	200	3720	**690**
TH01 2.5-2.6m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	1	<10	<50	<100	<100
TH01 4.2-4.5m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	53.3****	<10	240	2860	**430**
TH02 0.4-0.8m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	20.6***	<10	**120**	1790	**360**
TH03 0.5-0.6m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH03 1.5-1.6m	15/03/2016	COARSE	COM/IND		**0.2**	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH03 3.2-3.4m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH04 0.5-0.6m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	7.1**	<10	<50	**410**	**120**
TH04 3.5-3.6m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH05 0.5-0.6m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH05 2.0-2.1m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH06 0.5-0.6m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH05 4.5-4.6m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
TH06 2.0-2.1m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	**0.5**	<10	<50	**180**	**130**
TH06 4.5-4.6m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH07 0.4-0.5m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	56.6****	<10	**170**	3810*	**740**
BH07 3.3-3.4m	15/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH08 0.5-0.6m	16/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH08 2.5-2.6m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH09 0.4-0.5m	16/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH10 0.4-0.5m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	80.8****	<10	**190**	3200	**480**
BH11 0.4-0.5m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	4.4**	<10	<50	**360**	<100
BH11 2.7-2.8m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	3.6**	<10	<50	**120**	<100
BH12 0.3-0.4m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	2.5*	<10	<50	**340**	<100
BH12 1.5-1.6m	16/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	2.7*	<10	<50	**110**	<100
BH12 2.9-3.0m	16/03/2016	FINE	COM/IND		<0.2	<0.5	<0.5	<0.5	1.2	<10	<50	<100	<100
BH13 0.3-0.4m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH13 1.0-1.1m	16/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH10 2.1-2.2m	15/03/2016	COARSE	COM/IND		<0.2	<0.5	<0.5	<0.5	1.9*	<10	<50	<100	<100
BH10 3.4-3.5m	15/03/2016	FINE	COM/IND		**2.6**	**4.4**	<0.5	**9.7**	38.9****	**12**	260	**2290**	**170**

Table 23 Summary of Soil Analytical Results Compared with ESL D, August 2017

NEPM Ecological Screening Levels for Soil				EP080: BTEXN					EP080/071: TRH			
Bold - Indicates LOR Exceedances				Benzene	Toluene	Ethylbenzene	Xylenes	Benzo(a)pyrene	F1 (C6 - C10)	F2 (>C10 - C16)	F3 (>C16 - C34)	F4 (>C34 - C40)
Colour Shading - Indicates ESL Exceedances: >1 x, * 2-5 x, ** 5-20 x, *** 20-50 x, **** >50 x				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample ID	Sample Date	Soil Texture Class	Land Use	LOR 0.2	LOR 0.5	LOR 0.5	LOR 0.5	LOR 0.5	LOR 10	LOR 50	LOR 100	LOR 100
BH14 0.5-0.6	4/8/17	FINE	COM/IND	<0.2	<0.5	<0.5	<0.5	**27.2*** **	<10	**70**	**1600**	**350**
BH14 2.5-2.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH15 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**21*** **	<10	<50	**1140**	**220**
BH15 2.5-2.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**0.7**	<10	<50	<100	<100
BH16 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**27*** **	<10	**90**	**1640**	**400**
BH16 2.5-2.6	4/8/17	FINE	COM/IND	<0.2	<0.5	<0.5	<0.5	**2.6***	<10	<50	**160**	<100
BH17 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**24.6*** **	<10	**140**	**3120**	**940**
BH17 2.5-2.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**0.8**	<10	<50	**100**	<100
BH18 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**30.4*** **	<10	**100**	**1920**	**330**
BH18 2.1-2.2	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**2.3***	<10	<50	**170**	<100
BH19 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**10.9****	<10	<50	**830**	**140**
BH19 2.5-2.6	4/8/17	FINE	COM/IND	<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH20 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**2.5***	<10	<50	**190**	<100
BH20 2.5-2.6	4/8/17	FINE	COM/IND	<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100
BH21 0.5-0.6	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	**90.1**** **	<10	**440***	**5120***	**810**
BH21 2.1-2.2	4/8/17	FINE	COM/IND	<0.2	<0.5	<0.5	<0.5	**7.2****	<10	<50	**410**	<100
BH22 0.5-0.60	4/8/17	COARSE	COM/IND	<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100

6.4.2 Ecological Investigation Levels

Table 24 and Table 25 summarises samples that exceed EIL's for commercial and industrial setting at the site (highlighted). The following ESL exceedance were apparent at the site in the March 2016 event:

- Zinc concentrations exceeded the threshold EIL's in the following soil samples:
  - TH04: 0.4-0.6;
  - BH07: 0.4-0.5;
  - BH10: 3.4-3.5;
  - BH11: 0.4-0.5; and
  - BH12: 0.3-0.4 & 1.5-1.6
- Napthalene concentrations exceeded the threshold EIL's in the following soil samples:
  - BH10: 3.4-3.5;

Impact was primarily encountered in bores within (and not necessarily confined to) Zone B, C and E.

There were no EIL exceedences from the August 2017 sampling event.

Table 24 Summary of Soil Analytical Results Compared with EIL's, March 2016

Sample ID	Sample Date	EIL Land Use Sensitivity Class	Copper (CEC)	Copper (pH)	Nickel	Zinc	Chromium III	Lead	Arsenic	Napthalene
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TH01 0.4-0.8m	15/03/2016	COM/IND	63	63	15	100	13	83	<5	8
TH01 2.5-2.6m	15/03/2016	COM/IND	57	57	25	43	31	52	8	<1
TH01 4.2-4.5m	15/03/2016	COM/IND	56	56	15	109	14	109	7	5
TH02 0.4-0.8m	15/03/2016	COM/IND	68	68	11	181	5	67	<5	<1
TH03 0.5-0.6m	15/03/2016	COM/IND	7	7	3	19	4	8	<5	<1
TH03 1.5-1.6m	15/03/2016	COM/IND	35	35	24	31	6	9	<5	<1
TH03 3.2-3.4m	15/03/2016	COM/IND	<5	<5	4	12	6	<5	<5	<1
TH04 0.5-0.6m	15/03/2016	COM/IND	69	69	17	337	12	162	<5	<1
TH04 3.5-3.6m	15/03/2016	COM/IND	8	8	7	20	8	11	6	<1
TH05 0.5-0.6m	15/03/2016	COM/IND	65	65	25	40	13	5	<5	<1
TH05 2.0-2.1m	15/03/2016	COM/IND	90	90	22	52	15	49	<5	<1
TH06 0.5-0.6m	15/03/2016	COM/IND	65	65	29	22	27	<5	<5	<1
TH05 4.5-4.6m	15/03/2016	COM/IND	18	18	12	14	16	6	<5	<1
TH06 2.0-2.1m	15/03/2016	COM/IND	57	57	22	48	17	28	<5	<1
TH06 4.5-4.6m	15/03/2016	COM/IND	<5	<5	4	9	6	<5	<5	<1
BH07 0.4-0.5m	15/03/2016	COM/IND	56	56	13	305	10	404	<5	<1
BH07 3.3-3.4m	15/03/2016	COM/IND	22	22	9	28	11	36	<5	<1
BH08 0.5-0.6m	16/03/2016	COM/IND	43	43	18	37	13	13	<5	<1
BH08 2.5-2.6m	16/03/2016	COM/IND	56	56	25	10	30	<5	<5	<1
BH09 0.4-0.5m	16/03/2016	COM/IND	18	18	10	13	21	7	<5	<1
BH10 0.4-0.5m	16/03/2016	COM/IND	52	52	12	176	13	208	<5	1
BH11 0.4-0.5m	16/03/2016	COM/IND	61	61	34	566	22	196	14	<1
BH11 2.7-2.8m	16/03/2016	COM/IND	76	76	10	135	8	158	<5	<1
BH12 0.3-0.4m	16/03/2016	COM/IND	18	18	9	421	8	488	<5	<1
BH12 1.5-1.6m	16/03/2016	COM/IND	114	114	22	383	24	46	<5	<1
BH12 2.9-3.0m	16/03/2016	COM/IND	43	43	52	45	16	24	7	<1
BH13 0.3-0.4m	16/03/2016	COM/IND	13	13	12	66	13	45	<5	<1
BH13 1.0-1.1m	16/03/2016	COM/IND	16	16	9	50	12	69	<5	<1
BH10 2.1-2.2m	15/03/2016	COM/IND	27	27	16	28	22	18	<5	4
BH10 3.4-3.5m	15/03/2016	COM/IND	36	36	10	73	15	79	<5	536

Table 25 Summary of Soil Analytical Results Compared with EIL's, August 2017

NEPM Ecological Investigation Levels for Soil													
Bold - Indicates LOR Exceedances													
Colour Shading - Indicates ESL Exceedances: >1 x, * 2-5 x, ** 5-20 x, *** 20-50 x, **** >50 x													
Sample ID	Sample Date	EIL Land Use Sensitivity Class	Soil CEC (cmolc/kg)	Soil pH	Soil Grain Class	Copper (CEC) mg/kg	Copper (pH) mg/kg	Nickel mg/kg	Zinc mg/kg	Chromium III mg/kg	Lead mg/kg	Arsenic mg/kg	Naphthalene mg/kg
BH14 0.5-0.6	4/08/2017	COM/IND	35	6.0	F	92	92	23	146	17	227	12	<1
BH14 2.5-2.6	4/08/2017	COM/IND	20	6.0	C	6	6	9	26	5	12	<5	<1
BH15 0.5-0.6	4/08/2017	COM/IND	20	6.0	C	109	109	16	99	12	125	<5	<1
BH15 2.5-2.6	4/08/2017	COM/IND	20	6.0	C	44	44	8	44	9	126	<5	<1
BH16 0.5-0.6	4/08/2017	COM/IND	20	6.0	C	73	73	15	157	12	192	<5	<1
BH16 2.5-2.6	4/08/2017	COM/IND	35	6.0	F	24	24	8	23	8	91	<5	<1
BH17 0.5-0.6	4/08/2017	COM/IND	10	6.0	C	78	78	8	527	5	1270	<5	<1
BH17 2.5-2.6	4/08/2017	COM/IND	20	6.0	C	38	38	8	23	9	46	<5	<1
BH18 0.5-0.6	4/08/2017	COM/IND	20	6.0	C	62	62	13	314	10	1600	<5	4
BH18 2.1-2.2	4/08/2017	COM/IND	20	6.0	C	15	15	12	75	9	45	<5	1
BH19 0.5-0.6	4/08/2017	COM/IND	20	6.0	C	121	121	14	542	17	425	7	<1
BH19 2.5-2.6	4/08/2017	COM/IND	35	6.0	F	8	8	4	5	4	10	<5	<1
BH20 0.5-0.6	4/08/2017	COM/IND	20	6.0	C	50	50	16	71	4	80	<5	<1
BH20 2.5-2.6	4/08/2017	COM/IND	35	6.0	F	54	54	20	24	26	14	<5	<1
BH21 0.5-0.6	4/08/2017	COM/IND	20	6.0	C	68	68	15	237	12	249	<5	15
BH21 2.1-2.2	4/08/2017	COM/IND	35	6.0	F	39	39	12	52	14	67	<5	8
BH22 0.5-0.60	4/08/2017	COM/IND	10	6.0	C	68	68	31	18	30	<5	<5	<1

7 SOIL HUMAN HEALTH ASSESSMENT

The main exposure pathways and methods for assessing short term heath risk from contaminated soils are presented in Table 26. Vapour inhalation risk is addressed in the Health Screening Level section of this report.

Table 26 Summary of Exposure Pathways and Preliminary (Tier 1) Methods for Assessing Exposure Risk

Exposure Scenario	Contaminant Type	Tier 1 Assessment Method	Reference
Vapour Inhalation (Petroleum Vapour Intrusion – PVI)	Petroleum Hydrocarbons	HSL's (addressed in PVI section)	CRC CARE Tec Report 10
Dermal Contact		HSL's	
Dust Inhalation	Metals PAH's Organochlorides Phenols Herbicides Other Pesticides	Health Investigation Levels (HIL's)	NEPM (2013)
Soil Ingestion			

7.1 Guidelines

7.1.1 Land Classification

The CRC CARE guidelines have been referenced to ensure that the correct land use and density category has been adopted for the surrounding properties. Correct identification of land use and building density has implications for the application of threshold investigation limits for all exposure scenarios presented in Table 27. Aspects needing to be considered include:

- Whether or not the site is of sensitive land use such as a childcare center, preschool, primary school or aged care facility;
- The percentage of paved area to determine direct contact exposure risk; and
- Classification based on residential, recreational or commercial/industrial setting.

Although the setting is high density residential which fits with HSL B, as the future development plans for the site have commercial premises on the ground floor, it is classified as HSL D according to CRC CARE (2013) guidelines. The basis for this is limited chance for exposure to soil due to continuous paving and potential exposure to commercial workers during site development and future trenching works only.

Table 27 Summary of Land Use Setting and Density for Determining Exposure Risk

Property	Land Use Class	Land Use Density	Paved Area	Sensitive Land Use
2 Collins Street	D	High	100%	No

Table 28 summarises the properties in which the soil analytical results are expected to be relevant as well as the applicable land use class for defining the threshold limits.

Table 28 Summary of Land Use Class Adopted for Defining Soil Analysis Threshold Limits

Soil Bores	Relevant Properties	Adopted Land Use Class
TH1-TH6 & BH7-BH22	2 Collins Street	D

7.2 Findings

7.2.1 Dermal Contact - Petroleum Hydrocarbons

Table 29 and Table 30 presents soil hydrocarbon analytical results compared against CRC CARE HSL D guidelines for assessing dermal contact risk. A ground floor commercial premises has been assigned HSL D. The dermal contact risk is acceptable according to all land use guidelines.

Table 29 Soil Analytical Results Compared Against CRC CARE Guidelines for Dermal Contact (March 2016)

CRC CARE Health Screening Level Dermal Contact Hazard from Soil Hydrocabons			EP080: BTEXN					EP080/071: TRH			
			Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	C6 - C10 Fraction	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR			0.2	0.5	0.5	0.5	1	10	50	100	100
HSL A Low Density Residential			100	14000	4500	12000	1400	4400	3300	4500	6300
HSL B High Density Residential			140	21000	5900	17000	2200	5600	4200	5800	8100
HSL C Recreational			120	18000	5300	15000	1900	5100	3800	5300	7400
HSL D Comercial/Industrial			430	99000	27000	81000	11000	26000	20000	27000	38000
Date	Sample	HSL Class									
15/03/2016	TH01 0.4-0.8m	D	<0.2	<0.5	<0.5	<0.5	8	<10	210	3720	690
15/03/2016	TH01 2.5-2.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH01 4.2-4.5m	D	<0.2	<0.5	<0.5	<0.5	5	<10	250	2860	430
15/03/2016	TH02 0.4-0.8m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	120	1790	360
15/03/2016	TH03 0.5-0.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH03 1.5-1.6m	D	0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH03 3.2-3.4m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH04 0.5-0.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	410	120
15/03/2016	TH04 3.5-3.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH05 0.5-0.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH05 2.0-2.1m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH06 0.5-0.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH05 4.5-4.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	TH06 2.0-2.1m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	180	130
15/03/2016	TH06 4.5-4.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	BH07 0.4-0.5m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	170	3810	740
15/03/2016	BH07 3.3-3.4m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
16/03/2016	BH08 0.5-0.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
16/03/2016	BH08 2.5-2.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
16/03/2016	BH09 0.4-0.5m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
16/03/2016	BH10 0.4-0.5m	D	<0.2	<0.5	<0.5	<0.5	1	<10	190	3200	480
16/03/2016	BH11 0.4-0.5m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	360	<100
16/03/2016	BH11 2.7-2.8m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	120	<100
16/03/2016	BH12 0.3-0.4m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	340	<100
16/03/2016	BH12 1.5-1.6m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	110	<100
16/03/2016	BH12 2.9-3.0m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
16/03/2016	BH13 0.3-0.4m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
16/03/2016	BH13 1.0-1.1m	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
15/03/2016	BH10 2.1-2.2m	D	<0.2	<0.5	<0.5	<0.5	4	<10	<50	<100	<100
15/03/2016	BH10 3.4-3.5m	D	2.6	4.4	<0.5	9.7	536	29	800	2290	170

Table 30 Soil Analytical Results Compared Against CRC CARE Guidelines for Dermal Contact (August 2017)

CRC CARE Health Screening Level Dermal Contact Hazard from Soil Hydrocarbons'		EP080: BTEXN					EP080/071: TRH			
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	C6 - C10 Fraction	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR		0.2	0.5	0.5	0.5	1	10	50	100	100
HSL A Low Density Residential		100	14000	4500	12000	1400	4400	3300	4500	6300
HSL B High Density Residential		140	21000	5900	17000	2200	5600	4200	5800	8100
HSL C Recreational		120	18000	5300	15000	1900	5100	3800	5300	7400
HSL D Commercial/Industrial		430	99000	27000	81000	11000	26000	20000	27000	38000
Intrusive Maintenance Worker		1100	120000	85000	130000	29000	82000	62000	85000	120000
Date	Sample									
4/08/2017	BH14 0.5-0.6	<0.2	<0.5	<0.5	<0.5	<1	<10	**70**	**1600**	**350**
4/08/2017	BH14 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
4/08/2017	BH15 0.5-0.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	**1140**	**220**
4/08/2017	BH15 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
4/08/2017	BH16 0.5-0.6	<0.2	<0.5	<0.5	<0.5	<1	<10	**90**	**1640**	**400**
4/08/2017	BH16 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	**160**	<100
4/08/2017	BH17 0.5-0.6	<0.2	<0.5	<0.5	<0.5	<1	<10	**140**	**3120**	**940**
4/08/2017	BH17 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	**100**	<100
4/08/2017	BH18 0.5-0.6	<0.2	<0.5	<0.5	<0.5	**4**	<10	**100**	**1920**	**330**
4/08/2017	BH18 2.1-2.2	<0.2	<0.5	<0.5	<0.5	**1**	<10	<50	**170**	<100
4/08/2017	BH19 0.5-0.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	**830**	**140**
4/08/2017	BH19 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
4/08/2017	BH20 0.5-0.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	**190**	<100
4/08/2017	BH20 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100
4/08/2017	BH21 0.5-0.6	<0.2	<0.5	<0.5	<0.5	**15**	<10	**460**	**5120**	**810**
4/08/2017	BH21 2.1-2.2	<0.2	<0.5	<0.5	<0.5	**8**	<10	<50	**410**	<100
4/08/2017	BH22 0.5-0.60	<0.2	<0.5	<0.5	<0.5	<1	<10	<50	<100	<100

7.2.2 Dust Inhalation & Soil Ingestion

Combined dust inhalation and soil ingestion risk is assessed through the application of NEPM (2013) HIL's for exposure to soil contaminants.

Soil analytical results are compared against the HIL's presented in Table 31 and Table 32. The adopted guideline is HIL D for commercial use with limited scope for exposure to soil impact (CRC CARE 2013). The following HIL D exceedances for a commercial setting were apparent at the site:

- Benzo(a)pyrene concentration exceedances in the following soil samples:
  - TH01: 0.4-0.8 & 4.2-4.5;
  - BH07: 0.4-0.5;
  - BH10: 3.4-3.5; and
  - BH11: 0.4-0.5.
- Lead concentration exceedances in the following soil samples:
  - BH18: 0.5-0.6.

Potential dust inhalation and soil ingestion risks are apparent in (but not necessarily confined to) Zone B, C & E.

Table 31 Summary of Analytical Results Compared Against HIL D (March 2016)

NEPM Health Investigation Levels Non Hydrocarbon Compounds in Soil		Arsenic	Beryllium	Cadmium	Chromium Total	Cobalt	Copper	Lead	Manganese	Nickel	Vanadium	Zinc	Mercury	PAHs	Benzo(a)pyrene TEQ (WHO)
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR		5	1	1	2	2	5	5	5	2	5	5	0.1	0.5	0.5
HIL A Low Density Residential		100	60	20		100	6000	300	3800	400		7400	40	300	3
HIL B High Density Residential		500	90	150		600	30000	1200	14000	1200		60000	120	400	4
HIL C Recreational		300	90	90		300	17000	600	19000	1200		30000	80	300	2.999
HIL D Comercial/Industrial		3000	500	900		4000	240000	1500	60000	6000		400000	730	4000	40
Sample date:	Sample ID														
15/03/2016	TH01 0.4-0.8m	<5	<1	<1	13	16	63	83	274	15	47	100	0.2	676	79.9
15/03/2016	TH01 2.5-2.6m	8	<1	<1	31	14	57	52	224	25	51	43	0.1	13.8	1.3
15/03/2016	TH01 4.2-4.5m	7	<1	<1	14	11	56	109	234	15	45	109	0.2	871	77.7
15/03/2016	TH02 0.4-0.8m	<5	<1	<1	5	32	68	67	142	11	38	181	<0.1	292	30.4
15/03/2016	TH03 0.5-0.6m	<5	<1	<1	4	2	7	8	90	3	5	19	<0.1	<0.5	<0.5
15/03/2016	TH03 1.5-1.6m	<5	<1	<1	6	28	35	9	32	24	62	31	<0.1	<0.5	<0.5
15/03/2016	TH03 3.2-3.4m	<5	<1	<1	6	2	<5	<5	46	4	15	12	<0.1	<0.5	<0.5
15/03/2016	TH04 0.5-0.6m	<5	<1	<1	12	8	69	162	315	17	28	337	0.2	66.1	10.2
15/03/2016	TH04 3.5-3.6m	6	<1	<1	8	4	8	11	51	7	17	20	<0.1	<0.5	<0.5
15/03/2016	TH05 0.5-0.6m	<5	<1	<1	13	16	65	5	769	25	53	40	<0.1	<0.5	<0.5
15/03/2016	TH05 2.0-2.1m	<5	<1	<1	15	14	90	49	620	22	48	52	<0.1	<0.5	<0.5
15/03/2016	TH06 0.5-0.6m	<5	<1	<1	27	23	65	<5	373	29	106	22	<0.1	<0.5	<0.5
15/03/2016	TH05 4.5-4.6m	<5	<1	<1	16	17	18	6	159	12	94	14	<0.1	<0.5	<0.5
15/03/2016	TH06 2.0-2.1m	<5	<1	<1	17	13	57	28	434	22	53	48	0.1	3.1	0.6
15/03/2016	TH06 4.5-4.6m	<5	<1	<1	6	4	<5	<5	46	4	18	9	<0.1	<0.5	<0.5
15/03/2016	BH07 0.4-0.5m	<5	<1	3	10	11	56	404	281	13	39	305	0.4	636	81.1
15/03/2016	BH07 3.3-3.4m	<5	<1	<1	11	9	22	36	102	9	44	28	0.6	<0.5	<0.5
16/03/2016	BH08 0.5-0.6m	<5	<1	<1	13	24	43	13	231	18	82	37	<0.1	<0.5	<0.5
16/03/2016	BH08 2.5-2.6m	<5	<1	<1	30	16	56	<5	413	25	59	10	<0.1	<0.5	<0.5
16/03/2016	BH09 0.4-0.5m	<5	<1	<1	21	9	18	7	57	10	72	13	<0.1	<0.5	<0.5
16/03/2016	BH10 0.4-0.5m	<5	<1	<1	13	11	52	208	500	12	44	176	0.4	1070	116
16/03/2016	BH11 0.4-0.5m	14	<1	2	22	15	61	196	352	34	25	566	3.2	44.8	6.4
16/03/2016	BH11 2.7-2.8m	<5	<1	<1	8	10	76	158	237	10	32	135	0.1	35.9	4.7
16/03/2016	BH12 0.3-0.4m	<5	<1	<1	8	11	18	488	237	9	25	421	0.1	27.6	3.4
16/03/2016	BH12 1.5-1.6m	<5	<1	<1	24	25	114	46	502	22	110	383	0.1	26.5	3.5
16/03/2016	BH12 2.9-3.0m	7	1	<1	16	44	43	24	200	52	72	45	0.2	22.5	1.5
16/03/2016	BH13 0.3-0.4m	<5	1	<1	13	16	13	45	342	12	20	66	<0.1	2	<0.5
16/03/2016	BH13 1.0-1.1m	<5	<1	<1	12	10	16	69	189	9	48	50	0.3	<0.5	<0.5
15/03/2016	BH10 2.1-2.2m	<5	<1	<1	22	15	27	18	147	16	102	28	0.1	50.2	2.5
15/03/2016	BH10 3.4-3.5m	<5	<1	<1	15	10	36	79	175	10	51	73	0.6	1300	57.2

Table 32 Summary of Analytical Results Compared Against HIL D (August 2017)

Bold - Indicates LOR Exceedance in Non Metalic Compounds		EG005T: Total Metals by ICP-AES														EG035T: Total Re		
NEPM Health Investigation Levels (HIL's) Dust Inhalation and Soil Ingestion Assessment		Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium Total	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Vanadium	Zinc	Mercury	PAHs	Benzo(a)pyrene TEQ (WHO)
Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR		5	10	1	50	1	2	2	5	5	5	2	5	5	5	0.1	0.5	0.5
HIL A Low Density Residential		100		60	4500	20		100	6000	300	3800	400	200		7400	40	300	3
HIL B High Density Residential		500		90	40000	150		600	30000	1200	14000	1200	1400		60000	120	400	4
HIL C Recreational		300		90	20000	90		300	17000	600	19000	1200	700		30000	80	300	3
HIL D Comercial/Industrial		3000		500	3E+05	900		4000	2E+05	1500	60000	6000	10000		4E+05	730	4000	40
Sample date:	Sample ID																	
4/08/2017	BH14 0.5-0.6	12	120	<1	<50	<1	17	17	92	227	373	23	<5	53	146	0.6	**266**	**38**
4/08/2017	BH14 2.5-2.6	<5	<10	<1	<50	<1	5	10	6	12	135	9	<5	16	26	<0.1	**1.3**	<0.5
4/08/2017	BH15 0.5-0.6	<5	90	<1	<50	<1	12	16	109	125	279	16	<5	50	99	0.2	**217**	**30**
4/08/2017	BH15 2.5-2.6	<5	70	<1	<50	<1	9	9	44	126	245	8	<5	45	44	1.1	**7.1**	**0.9**
4/08/2017	BH16 0.5-0.6	<5	130	<1	<50	<1	12	19	73	192	326	15	<5	44	157	1.6	**354**	**38**
4/08/2017	BH16 2.5-2.6	<5	80	<1	<50	<1	8	8	24	91	153	8	<5	36	23	0.2	**40.9**	**3.5**
4/08/2017	BH17 0.5-0.6	<5	80	<1	<50	2	5	7	78	1270	277	8	<5	24	527	0.2	**178**	**34**
4/08/2017	BH17 2.5-2.6	<5	60	<1	<50	<1	9	8	38	46	237	8	<5	35	23	0.6	**19.3**	**1**
4/08/2017	BH18 0.5-0.6	<5	80	<1	<50	3	10	15	62	1600	434	13	<5	41	314	0.3	**407**	**44**
4/08/2017	BH18 2.1-2.2	<5	30	<1	<50	<1	9	15	15	45	160	12	<5	17	75	0.1	**40.6**	**3.1**
4/08/2017	BH19 0.5-0.6	7	180	<1	<50	<1	17	13	121	425	323	14	<5	47	542	4.3	**108**	**15**
4/08/2017	BH19 2.5-2.6	<5	40	<1	<50	<1	4	3	8	10	120	4	<5	22	5	<0.1	**1.2**	<0.5
4/08/2017	BH20 0.5-0.6	<5	70	<1	<50	<1	4	11	50	80	593	16	<5	48	71	0.1	**23.8**	**3.3**
4/08/2017	BH20 2.5-2.6	<5	1660	<1	<50	<1	26	22	54	14	249	20	<5	124	24	<0.1	<0.5	<0.5
4/08/2017	BH21 0.5-0.6	<5	120	<1	<50	<1	12	11	68	249	376	15	<5	45	237	0.5	**1590**	**128**
4/08/2017	BH21 2.1-2.2	<5	80	<1	<50	<1	14	14	39	67	178	12	<5	52	52	1.2	**134**	**10**
4/08/2017	BH22 0.5-0.60	<5	190	<1	<50	<1	30	29	68	<5	546	31	<5	100	18	<0.1	<0.5	<0.5

8 GROUNDWATER ENVIRONMENTAL AND HEALTH ASSESSMENT

8.1 Protected Environmental Values

The quality of groundwater in Tasmania is managed under the SPWQM which is an acronym for the State Policy on Water Quality Management 1997 (DPIWE, 1997) ('the State Policy'). The stated purpose of the State Policy is to:

"achieve the sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of Tasmania's Resource Management and Planning System."

The State Policy defines a range of Protected Environmental Values (PEVs) for surface and groundwater, which are uses of the water resource that are to be protected. For groundwater, PEVs are allocated based upon the salinity (concentration of total dissolved solids) of the groundwater. The lower the salinity, the greater the number of uses (PEVs) that are likely to apply to the groundwater body.

The Environmental Protection Authority (EPA) considers that groundwater is polluted where current and / or future PEVs for the relevant segment are precluded. PEVs of groundwater are considered to be precluded when the allocated groundwater quality objectives for those PEVs have been exceeded.

The State Policy defines a range of PEV's on the basis of groundwater salinity. Groundwater electrical conductivity (EC) is used as a basis in which to assess total dissolved solid (TDS) concentrations at the site through a conservative ratio of 1 mg/L TDS to 0.75 µS/cm EC.

Based on the previous groundwater monitoring event, EC at the site ranges from 1281 to 5510 µS/cm which approximately translates to a TDS concentration at the site ranging from 960 milligrams per litre (mg/L) (7116-05) to 4132 mg/L (7116-02) with an average value of 2015 mg/L.

Groundwater beneath the site generally falls within Category B when classified according to the State Policy. The environmental values requiring protection are presented in Table 33.

Table 33 Environmental Values and Uses of Groundwater Requiring Protection (State Policy on Water Quality Management 1997).

Protected Environmental Value	PEV Based on TDS Concentrations (mg/L)			
	A	B	C	D
	Less than 1000	1000 – 3500	3500 – 13000	Greater than 13000
Drinking Water	*			
Irrigation	*	*		
Industry	*	*	*	
Stock Watering	*	*	*	
Ecosystem Protection	*	*	*	*

Note: Blue Shading Indicates Protected Environmental Value Requirement

8.2 Guidelines

8.2.1 Drinking Water

The State Policy recommends that guidelines for the protection of human health be sourced from the National Health and Medical Research Council (NHMRC). The NHMRC in collaboration with the Natural Resource Management Ministerial Council (NRMMC) published the 2011 Australian Drinking Water Guidelines (ADWG). The ADWG's are reiterated in the NEPM (2013) are considered the most recent guideline for drinking water quality in Australia and have been adopted for this investigation.

8.2.2 Irrigation

The following guideline would normally be adopted at the site:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000 (ANZECC, 2000) - Water Quality for Irrigation and General Water Use.

For irrigated waters, guidelines are available for heavy metals but not for hydrocarbons.

8.2.3 Industrial Water Use

No relevant guidelines are available for industrial water use.

8.2.4 Stock Watering

The following guidelines are to be adopted at the site:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australia and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, 2000 (ANZECC, 2000) - Livestock Drinking Water Quality: Recommended water quality trigger values (low risk) for heavy metals and metalloids in livestock drinking water.
- For organic contaminants the ANZECC (2000) guideline recommends that drinking water guidelines for human health be adopted. Therefore the criteria for organic contaminants in groundwater for livestock drinking are taken from ADWG 2011.

8.2.5 Ecosystem Protection

The State Policy recommends adopting the following guideline:

- Australian Water Quality Guidelines for Fresh and Marine Waters, (ANZECC, 1992) and Agriculture and Resource Management Council of Australia and New Zealand.

A more recent version of this publication has been released:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000).

The ANZECC 2000 guidelines are reiterated as Australian Water Quality Guidelines (AWQG's) in NEPM (2013) and are considered the primary reference guideline in this investigation for all PEVs other than drinking water.

8.3 Relevant PEV's

Environmental receptors are summarised in Table 34.

Table 34 Summary of Potential Environmental Receptors at the Site

Protected Environmental Value	Potential Pathway	Details
Drinking Water	No	Drinking Water is Not a PEV at the Site
Irrigation	No	Groundwater irrigation bores are used locally at five (5) locations within 70 m of the site.
Industry	No	There is no industry downgradient of the site
Stock Watering	No	There is no stock watering downgradient of the site
Ecosystem Protection	Yes	Victoria Dock waterline is located 220 m to the south of the site. This is the primary environmental receptor downgradient of the site.

The main receptors of potential concern to be investigated at the site include:

- Ecosystem Protection.

8.4 Ecosystem

8.4.1 Receptors

The localised receptor is expected to be Victoria Dock which is located at the exit point of the previous onsite stream (Figure 12). There is the possibility that groundwater may migrate towards the new Hobart Rivulet alignment (through leaky infrastructure).

An assessment has been conducted on the quality of groundwater within the Hobart Rivulet and the Derwent River. Heavy metal concentrations have largely improved in both the settings. Historically in the 1980's concentrations were more consistent with ANZECC guideline 80% species protection limits.

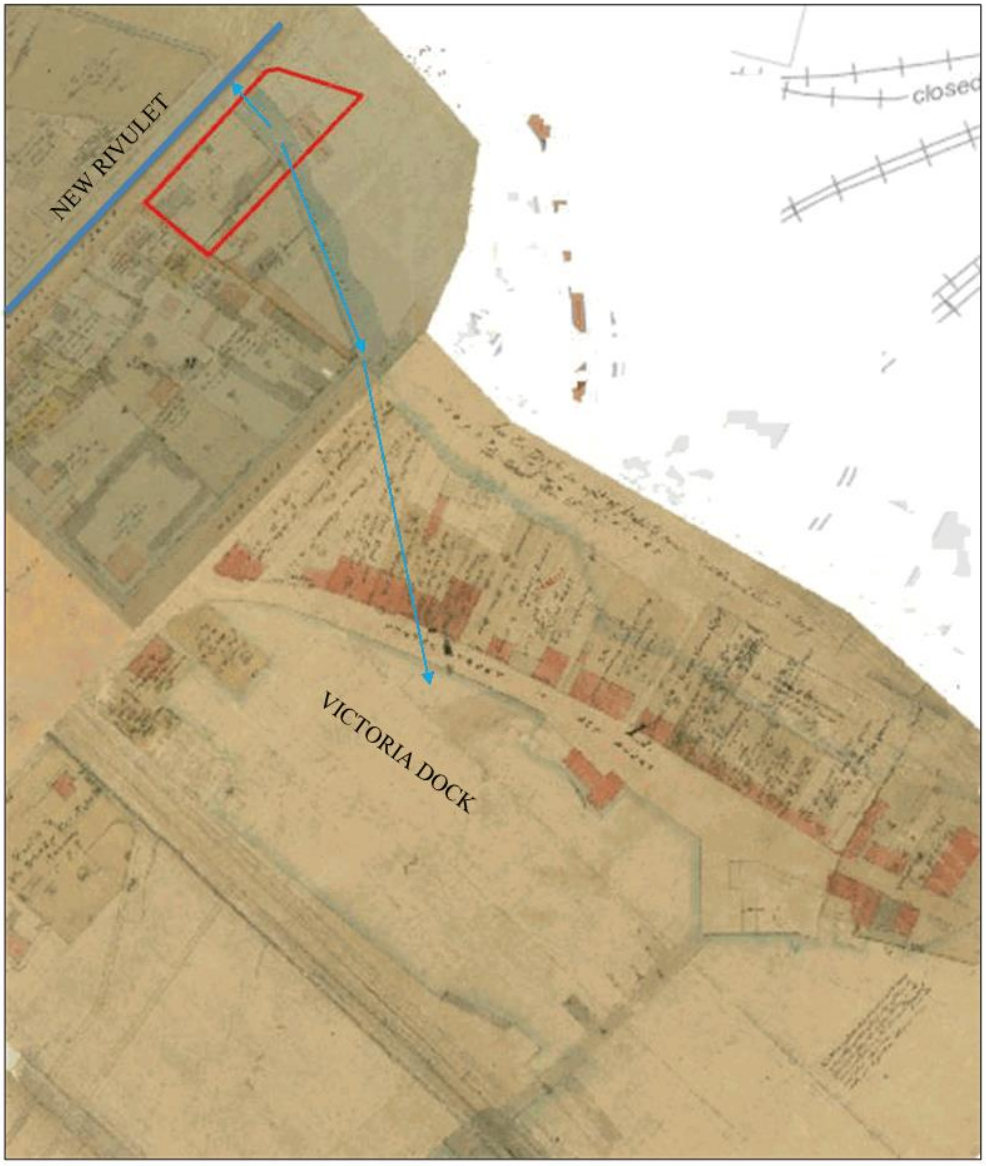


Figure 12 Likely groundwater migration pathway from the site along the original stream channel.

Typical concentrations with the Hobart Rivulet and the Derwent River nowadays are more consistent with 90% species protection with the following typical values/ranges:

- Mercury – 0.1 ug/L in Derwent River (Chapman 1992) with ANZECC 90% protection at 0.7 ug/L
- Copper – 5 ug/L in Hobart Rivulet (DEP 2011) with ANZECC 90% protection at 3 ug/L
- Lead – 5 ug/L with common 10 ug/L in Hobart Rivulet (DEP 2011) with ANZECC 90% protection at 6.6 ug/L
- Zinc – 50 ug/L in Hobart Rivulet (DEP 2011) with ANZECC 90% protection at 23 ug/L

The groundwater results are to be compared against ANZECC (2000) 90% species protection guideline limits. This same guideline should apply to surface waters at the site. It has been established that threshold limit exceedances must be 10,000 over the limit for groundwater impact to the Hobart Rivulet be of concern. Perhaps a greater risk is the chance that surface waters will mobilise contaminants into the waterways.

8.4.2 Findings

BTEX, Naphthalene and TRH groundwater analytical results were compared against March 2016 ANZECC (90%) guidelines presented in Table 35 to Table 37and August 2017 ANZECC (90%) presented in Table 38 to Table 40.

There were no PAH or TPH exceedances in groundwater collected from sampled wells in either groundwater monitoring event.

Metal concentrations in groundwater were exceeded in groundwater collected during the March 2016 event in the following wells:

- Copper: 7116-04 & 7116-05;
- Zinc: 7116-04 & 7116-05; and
- Mercury: 7116-01 & 7116-04.

Metal concentrations in groundwater were exceeded in groundwater collected during the August 2017 event in the following wells:

- Copper: 7116-03, 7116-04 &7116-05 which are right on the investigation limit of 0.003 ug/L;
- A single isolated occurrence of vanadium in 7116-04.

Table 35 TPH, Naphthalene & BTEX Analytical Results Compared Against NEPM (2013) AWQG - Marine

ANZECC (2000) Marine Water (90% trigger)		Benzene	Toluene	Ethyl-benzene	Xylene			BTEX	Napthalene	TRH Carbon Chain Fractions						
					M, P	O	Total	Total		6 - 10	F1	>10 - 16	>16 - 34	>34 - 40	>10 - 40	F2
UNITS		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		1	2	2	2	2	2	1	5	20	20	100	100	100	100	100
Investigation Limit		900							90							
Date Collected	Water Sample ID															
15/03/2016	7116-01	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100
15/03/2016	7116-02	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	160	<100	160	<100
15/03/2016	7116-04	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100
15/03/2016	7116-05	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100

Table 36 PAH Analytical Results Compared Against NEPM (2013) AWQG - Marine

ANZECC (2000) Marine Water (90% trigger)		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Sum of polycyclic aromatic hydrocarbons	Benzo(a)pyrene TEQ (WHO)
UNITS		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1	1	0.5	0.5
Investigation Limit		90																	
Date Collected	Water Sample ID																		
15/03/2016	7116-01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5
15/03/2016	7116-02	<1.0	2.5	<1.0	<1.0	1.6	1.2	4.2	4.5	1.9	1.8	2.1	<1.0	2	<1.0	<1.0	1.3	23.1	2.4
15/03/2016	7116-04	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5
15/03/2016	7116-05	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5

Table 37 Metal Analytical Results Compared Against NEPM (2013) AWQG - Marine

ANZECC (2000) Marine Water (90% trigger)		Arsenic	Beryllium	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Vanadium	Zinc	Boron	Mercury	Hexavalent Cr
UNITS		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR		0.001	0.001	0.001	1E-04	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.005	0.05	1E-04	0.01
Investigation Limit					0.014	0.048	0.014	0.003	0.007		0.2		0.16	0.032		7E-04	0.02
Date Collected	Water Sample ID																
15/03/2016	7116-01	0.016	<0.001	0.038	<0.0001	<0.001	<0.001	<0.001	<0.001	1.7	0.002		<0.01	<0.01		0.012	
15/03/2016	7116-02	0.003	<0.001	0.085	<0.0001	<0.001	0.001	0.002	0.003	0.391	0.002		<0.01	<0.01		<0.005	
15/03/2016	7116-04	0.003	<0.001	0.046	<0.0001	<0.001	0.001	0.005	<0.001	0.123	0.003		<0.01	0.15		0.005	
15/03/2016	7116-05	0.002	<0.001	0.004	<0.0001	<0.001	<0.001	0.003	<0.001	0.049	<0.001		<0.01	0.14		<0.005	

Table 38 TPH, Naphthalene & BTEX Analytical Results Compared Against NEPM (2013) AWQG - Marine

ANZECC (2000) Marine Water (90% trigger)		Benzene	Toluene	Ethyl-benzene	Xylene			BTEX	Napthalene	TRH Carbon Chain Fractions						
					M, P	O	Total	Total		6 - 10	F1	>10 - 16	>16 - 34	>34 - 40	>10 - 40	F2
UNITS		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		1	2	2	2	2	2	1	5	20	20	100	100	100	100	100
Investigation Limit		900							90							
Date Collected	Water Sample ID															
7/08/2017	7116-2	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100
7/08/2017	7116-3	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100
7/08/2017	7116-4	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100
7/08/2017	7116-5	<1	<2	<2	<2	<2	<2	<1	<5	<20	<20	<100	<100	<100	<100	<100

Table 39 PAH Analytical Results Compared Against NEPM (2013) AWQG - Marine

ANZECC (2000) Marine Water (90% trigger)		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3,cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of polycyclic aromatic hydrocarbons	Benzo(a)pyrene TEQ (WHO)
UNITS		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		1	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1	1	0.5	0.5
Investigation Limit		90																	
Date Collected	Water Sample ID																		
7/08/2017	7116-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5
7/08/2017	7116-3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	<0.5	<0.5
7/08/2017	7116-4	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	1.5	<0.5
7/08/2017	7116-5	7.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5	<1.0	<1.0	<1.0	7.6	<0.5

Table 40 Metal Analytical Results Compared Against NEPM (2013) AWQG - Marine

ANZECC (2000) Marine Water (90% trigger)		Arsenic	Beryllium	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Vanadium	Zinc	Boron	Mercury	Hexavalent Cr
UNITS		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR		0.001	0.001	0.001	1E-04	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.005	0.05	0.0001	0.01
Investigation Limit					0.014	0.048	0.014	0.003	0.007		0.2		0.16	0.032		0.0007	0.02
Date Collected	Water Sample ID																
7/08/2017	7116-2	0.003	<0.001	0.108	<0.0001	<0.001	0.002	<0.001	<0.001	0.915	0.003		<0.01	<0.005		<0.0001	
7/08/2017	7116-3	0.001	<0.001	0.115	<0.0001	<0.001	<0.001	0.003	<0.001	0.141	0.001		<0.01	0.006		<0.0001	
7/08/2017	7116-4	0.002	<0.001	0.016	<0.0001	<0.001	<0.001	0.003	<0.001	0.069	0.001		0.2	<0.005		<0.0001	
7/08/2017	7116-5	0.001	<0.001	0.014	<0.0001	<0.001	<0.001	0.003	<0.001	0.144	<0.001		0.12	<0.005		<0.0001	

8.4.3 Exposure Pathways & Receptor Risks

There is a risk following site demolition works that surface water runoff may become impacted by residual contaminants within the fill and natural soils. Given the martial dominantly comprises of clay, there is a higher chance that water will have the tendency to runoff rather then percolate. There is a possibility of contaminant leaching to the water table, but given the calculated mass loadings, contaminants must have particularly high concentrations for nearby ecosystems to be impacted by contaminant flushing. Long term effects are considered minor given greater chance for dilution from low groundwater flux into the receiving environment.

Surface waters at the site are the primary concern in terms of short term mass loading into the receiving environment via the stormwater system. Similarly, there is a risk that impacted surface waters and soil may mobilise into the neighboring sites (The Woolstore Apartment Carpark in particular). A contamination management plan (CMP) and subsequent soil and water management plan (SWMP) will need to be put in place to address this risk.

The main contaminants of concern from soil leaching (based on the soil assessment) include the following:

- BTEX;
- TPH;
- Naphthalene;
- Cadmium;
- Copper;
- Lead; and
- Possibly mercury.

9 TRENCH WORKER PVI ASSESSMENT – HSL's

9.1 Classification

9.1.1 Soil

The following Health Screening Assessment is based on hydrocarbon vapour intrusion risk to subsurface excavation workers from hydrocarbon impacted soil. Soil HSL's for assessing hydrocarbon risk to maintenance workers are based on CRC CARE Technical Report 10 guidelines (Friebel & Nadebaum 2011) and the following variables:

- Dominant grain size class of material *at and below the soil sample depth* based on US Agriculture Soil Classification System (SCS) and partitioning into either sand, silt or clay; and
- Classifying soil according to depth ranges: 0 to 2 m; 2 to 4 m; 4 to 8 m; and greater than 8 m;

9.2 Findings

9.2.1 Soil

Table 41 and Table 42 present the HSL vapour inhalation risk to trench workers. There were no HSL exceedances for vapour inhalation risk to trench workers.

Table 41 Summary of Soil Analytical Results Compared against HSL's for Intrusive Maintenance Workers March 2016

CRC CARE Health Screening Level Assessment for PHC Inhalation Risk To Trench Workers				EP080: BTEXN					EP080/071: TRH	
Bold - Indicates LOR Exceedances				Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	C6 - C10 Fraction	>C10 - C16 Fraction
Dark Grey Shading - Indicates HSL Exceedances: >1 x, * 2-5 x, ** 5-20 x, * 20-50 x, **** >50 x**				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample ID	Sample Date	SCS Class (where applicable)	Grain Class	0.2	0.5	0.5	0.5	1	10	50
TH01 0.4-0.8m	15/03/2016	Gravelly Sandy CLAY	Clay	<0.2	<0.5	<0.5	<0.5	**8**	<10	**210**
TH01 2.5-2.6m	15/03/2016	Sandy CLAY	Clay	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH01 4.2-4.5m	15/03/2016	Clayey Sandy SILT	CLAY	<0.2	<0.5	<0.5	<0.5	**5**	<10	**250**
TH02 0.4-0.8m	15/03/2016	Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	**120**
TH03 0.5-0.6m	15/03/2016	GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH03 1.5-1.6m	15/03/2016	Clayey GRAVEL	SAND	**0.2**	<0.5	<0.5	<0.5	<1	<10	<50
TH03 3.2-3.4m	15/03/2016	Clayey Sandy SILT	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH04 0.5-0.6m	15/03/2016	Sandy GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH04 3.5-3.6m	15/03/2016	Clayey Sandy SILT	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH05 0.5-0.6m	15/03/2016	Sandy GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH05 2.0-2.1m	15/03/2016	Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH06 0.5-0.6m	15/03/2016	Sandy GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH05 4.5-4.6m	15/03/2016	Clayey Sandy SILT	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH06 2.0-2.1m	15/03/2016	Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH06 4.5-4.6m	15/03/2016	Sandy Clayey SILT	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH07 0.4-0.5m	15/03/2016	Sandy GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	**170**
BH07 3.3-3.4m	15/03/2016	Sandy Clayey SILT	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH08 0.5-0.6m	16/03/2016	Silty CLAY	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH08 2.5-2.6m	16/03/2016	Clayey GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH09 0.4-0.5m	16/03/2016	Sandy CLAY	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH10 0.4-0.5m	16/03/2016	Sandy Clayey GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	**1**	<10	**190**
BH11 0.4-0.5m	16/03/2016	GRAVEL	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH11 2.7-2.8m	16/03/2016	Gravelly Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH12 0.3-0.4m	16/03/2016	Gravelly SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH12 1.5-1.6m	16/03/2016	Sandy Silty CLAY	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH12 2.9-3.0m	16/03/2016	Sandy Silty CLAY	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH13 0.3-0.4m	16/03/2016	Gravelly Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH13 1.0-1.1m	16/03/2016	Gravelly Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH10 2.1-2.2m	15/03/2016	Gravelly Clayey SAND	SAND	<0.2	<0.5	<0.5	<0.5	**4**	<10	<50
BH10 3.4-3.5m	15/03/2016	Sandy Clayey SILT	CLAY	**2.6**	**4.4**	<0.5	**9.7**	**536**	**29**	**800**

Table 42 Summary of Soil Analytical Results Compared against HSL's for Intrusive Maintenance Workers August 2017

CRC CARE Health Screening Level Assessment for PHC Inhalation Risk To Trench Workers				EP080: BTEXN					EP080/071: TRH	
Bold - Indicates LOR Exceedances										
Dark Grey Shading - Indicates HSL Exceedances: >1 x, * 2-5 x, ** 5-20 x, * 20-50 x, **** >50 x**				Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	C6 - C10 Fraction	>C10 - C16 Fraction
Sample ID	Sample Date	Depth Class	Grain Class	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				LOR 0.2	LOR 0.5	LOR 0.5	LOR 0.5	LOR 1	LOR 10	LOR 50
BH14 0.5-0.6	4/08/2017	0 to 2m	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	**70**
BH14 2.5-2.6	4/08/2017	2 to 4m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH15 0.5-0.6	4/08/2017	0 to 2m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH15 2.5-2.6	4/08/2017	2 to 4m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH16 0.5-0.6	4/08/2017	0 to 2m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	**90**
BH16 2.5-2.6	4/08/2017	2 to 4m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH17 0.5-0.6	4/08/2017	0 to 2m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	**140**
BH17 2.5-2.6	4/08/2017	2 to 4m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH18 0.5-0.6	4/08/2017	0 to 2m	CLAY	<0.2	<0.5	<0.5	<0.5	**4**	<10	**100**
BH18 2.1-2.2	4/08/2017	2 to 4m	SAND	<0.2	<0.5	<0.5	<0.5	**1**	<10	<50
BH19 0.5-0.6	4/08/2017	0 to 2m	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH19 2.5-2.6	4/08/2017	2 to 4m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH20 0.5-0.6	4/08/2017	0 to 2m	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH20 2.5-2.6	4/08/2017	2 to 4m	CLAY	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH21 0.5-0.6	4/08/2017	0 to 2m	CLAY	<0.2	<0.5	<0.5	<0.5	**15**	<10	**460**
BH21 2.1-2.2	4/08/2017	2 to 4m	CLAY	<0.2	<0.5	<0.5	<0.5	**8**	<10	<50
BH22 0.5-0.60	4/08/2017	0 to 2m	SAND	<0.2	<0.5	<0.5	<0.5	<1	<10	<50

10 INDOOR INHABITANT PVI ASSESSMENT – HSL's

The HSL assessment approach is generally the first investigation phase adopted for assessing PVI risk at petroleum hydrocarbon (PHC) impacted sites. HSL guidelines have been applied for samples collected from the site to account for risks that may be associated with volatile hydrocarbon vapour intrusion into confined spaces where there may be an inhalation risk through longer term exposure. This does not constitute a full vapour risk assessment but provides additional information from which to further quantify any risk.

A detailed investigation is recommended over an HSL assessment where an acute risk has been identified at the site (CRC CARE 2013) as a result of:

- Migrating product on surface soils beneath buildings;
- Strong PHC odors;
- Flammable risk in confined spaces; and/or
- Health complaints from occupants.

Based on the preliminary site visit, none of the above conditions have been identified at the site.

PVI risk is initially interpreted through the development of HSL threshold limits from the following classifications:

- The geology and or hydrogeology of the investigation point; and
- Land use sensitivity:

The resulting HSL threshold limits are compared with laboratory analytical results.

10.1 Land Use Class

For surrounding properties, the potential PVI risk is characterized through application of CRC CARE HSL's for each individual properties based on their existing land use (NEPM 2013; Friebel & Nadebaum 2010). The CRC CARE guidelines have been referenced to ensure that the correct land use and density category has been adopted for the surrounding land and to ensure health risks are consistent with the HSL models. Aspects considered include the:

- Sensitivity of the existing or potential land use;
- Percentage of paved area for defining potential vapour migration risk;
- *Type of ground floor car park which may influence the confinement of PHC vapors;*
- Presence of a slab or cavity for discerning vapour intrusion risk.

For proposed future land use, the following HSL's for commercial use are adopted for the site:

- HSL D for indoor commercial spaces located on the first floor.

10.2 Selected Media for Assessing PVI Risk

Table 43 presents a summary of the preferred HSL approach to assessing PVI risk.

Table 43 Preferred Methods for Determining Site PVI Risk

Media Analysed	Method	Limitations	Order of Preference
Soil Gas	Concentrations of a soil gas through a soil vapor probe	This approach provides the most reliable data in interpreting PVI risk, although direct modelling should be applied concentrations exceed HSL threshold limits.	Primary
Groundwater	Concentrations of PHC in groundwater through deployment of monitoring wells	Determining PVI risk based on groundwater is inherently conservative when interpreting vapour risk to account for not readily discernable preferential pathways. Reference may be drawn to alternative assessment approaches: 1) Application of site specific conditions to the CRC CARE model for assessing PVI risk 2) Soil gas interpretation for areas where a PVI risk is identified from groundwater analysis.	Secondary
Soil	Concentrations of PHC in soil	Concentrations in soil may be subject variability due to soil moisture, organic content and oxygen ingress all which create significant bias in threshold values. Reliance is place on utilizing groundwater analysis over soil.	Tertiary

Onsite PVI risk is assessed through both soil and groundwater analytical results.

10.3 Soil

10.3.1 Guidelines

Soil HSL's are specific to each soil sample and involves characterisation based on the following variables:

- Land use class;
- Dominant grain size class of material *above the soil sample depth* based on US Agriculture Soil Classification System (SCS) and partitioning into either sand, silt or clay; and
- Classifying soil according to depth ranges: 0 to 1 m; 1 to 2 m; 2 to 4 m; and greater than 4 m;

CRC CARE Guidelines stipulate that the depth class used in the soil assessment needs to the depth of impacted soil below the habitable space. Given the proposed development will be built directly on ground level, as per CRC Care Guidelines (Friebel & Nadebaum 2011) a commercial (HSL D) setting has been adopted for:

- Commercial workers located on the ground floor of the building.
- The assessment has been conducted based on slab located directly on ground with absence of fill.

10.3.2 Findings

Soil sampling results (Certificate of Analysis) are presented in Appendix 7. Soil samples have been assessed against the elected NEPM (2013) health screening levels (HSL) to determine potential hydrocarbon vapour risks to site users.

There are no Tier 1 PVI HSL exceedances for assessing indoor vapour intrusion risk to residents within the building and commercial workers on the ground floor level (Table 44 & Table 45).

Table 44 Soil Analytical Results Compared Against HSL D Limits for commercial workers on Ground Floor, March 2016

Soil Hydrocarbon HSL's for Assessing Indoor Vapour Intrusion (NEPM 2013)					EP080: BTEXN					EP080/071: TRH	
Bold - Indicates LOR Exceedances					Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	F1	F2
Colour Shading - Indicates HSL Exceedances: >1 x, * 2-5 x, ** 5-20 x, *** 20-50 x, **** >50 x											
Sample ID	Sample Date	SCS Class (where applicable)	Grain Class	HSL	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					LOR 0.2	LOR 0.5	LOR 0.5	LOR 0.5	LOR 1	LOR 10	LOR 50
TH01 0.4-0.8m	15/03/2016	Gravelly Sandy CLA	Clay	D	<0.2	<0.5	<0.5	<0.5	**8**	<10	**200**
TH01 2.5-2.6m	15/03/2016	Sandy CLAY	Clay	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH01 4.2-4.5m	15/03/2016	Clayey Sandy SILT	CLAY	D	<0.2	<0.5	<0.5	<0.5	**5**	<10	**240**
TH02 0.4-0.8m	15/03/2016	Clayey SAND	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	**120**
TH03 0.5-0.6m	15/03/2016	GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH03 1.5-1.6m	15/03/2016	Clayey GRAVEL	SAND	D	**0.2**	<0.5	<0.5	<0.5	<1	<10	<50
TH03 3.2-3.4m	15/03/2016	Clayey Sandy SILT	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH04 0.5-0.6m	15/03/2016	Sandy GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH04 3.5-3.6m	15/03/2016	Clayey Sandy SILT	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH05 0.5-0.6m	15/03/2016	Sandy GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH05 2.0-2.1m	15/03/2016	Clayey SAND	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH06 0.5-0.6m	15/03/2016	Sandy GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH05 4.5-4.6m	15/03/2016	Clayey Sandy SILT	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH06 2.0-2.1m	15/03/2016	Clayey SAND	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
TH06 4.5-4.6m	15/03/2016	Sandy Clayey SILT	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH07 0.4-0.5m	15/03/2016	Sandy GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	**170**
BH07 3.3-3.4m	15/03/2016	Sandy Clayey SILT	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH08 0.5-0.6m	16/03/2016	Silty CLAY	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH08 2.5-2.6m	16/03/2016	Clayey GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH09 0.4-0.5m	16/03/2016	Sandy CLAY	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH10 0.4-0.5m	16/03/2016	Sandy Clayey GRAV	SAND	D	<0.2	<0.5	<0.5	<0.5	**1**	<10	**190**
BH11 0.4-0.5m	16/03/2016	GRAVEL	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH11 2.7-2.8m	16/03/2016	Gravelly Clayey SA	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH12 0.3-0.4m	16/03/2016	Gravelly SAND	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH12 1.5-1.6m	16/03/2016	Sandy Silty CLAY	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH12 2.9-3.0m	16/03/2016	Sandy Silty CLAY	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH13 0.3-0.4m	16/03/2016	Gravelly Clayey SA	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH13 1.0-1.1m	16/03/2016	Gravelly Clayey SA	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH10 2.1-2.2m	15/03/2016	Gravelly Clayey SA	SAND	D	<0.2	<0.5	<0.5	<0.5	**4**	<10	<50
BH10 3.4-3.5m	15/03/2016	Sandy Clayey SILT	CLAY	D	**2.6**	**4.4**	<0.5	**9.7**	**536**	**12**	**260**

Table 45 Soil Analytical Results Compared Against HSL D Limits for commercial workers on Ground Floor, August 2017

Soil Hydrocarbon HSL's for Assessing Indoor Vapour Intrusion (NEPM 2013)					EP080: BTEXN					EP080/071: TRH	
Bold - Indicates LOR Exceedances					Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	F1	F2
Colour Shading - Indicates HSL Exceedances: >1 x, * 2-5 x, ** 5-20 x, *** 20-50 x, **** >50 x											
Sample ID	Sample Date	Depth Class	Grain Class	HSL	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
					LOR 0.2	LOR 0.5	LOR 0.5	LOR 0.5	LOR 1	LOR 10	LOR 50
BH14 0.5-0.6	4/08/2017	0 - 1	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	**70**
BH14 2.5-2.6	4/08/2017	2 - 4	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH15 0.5-0.6	4/08/2017	0 - 1	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH15 2.5-2.6	4/08/2017	2 - 4	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH16 0.5-0.6	4/08/2017	0 - 1	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	**90**
BH16 2.5-2.6	4/08/2017	2 - 4	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH17 0.5-0.6	4/08/2017	0 - 1	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	**140**
BH17 2.5-2.6	4/08/2017	2 - 4	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH18 0.5-0.6	4/08/2017	0 - 1	CLAY	D	<0.2	<0.5	<0.5	<0.5	**4**	<10	**100**
BH18 2.1-2.2	4/08/2017	2 - 4	SAND	D	<0.2	<0.5	<0.5	<0.5	**1**	<10	<50
BH19 0.5-0.6	4/08/2017	0 - 1	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH19 2.5-2.6	4/08/2017	2 - 4	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH20 0.5-0.6	4/08/2017	0 - 1	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH20 2.5-2.6	4/08/2017	2 - 4	CLAY	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50
BH21 0.5-0.6	4/08/2017	0 - 1	CLAY	D	<0.2	<0.5	<0.5	<0.5	**15**	<10	**440**
BH21 2.1-2.2	4/08/2017	2 - 4	CLAY	D	<0.2	<0.5	<0.5	<0.5	**8**	<10	<50
BH22 0.5-0.60	4/08/2017	0 - 1	SAND	D	<0.2	<0.5	<0.5	<0.5	<1	<10	<50

10.3.3 Receptor Risk

Receptors identified in this HSL assessment are based on long term vapour intrusion into confined habitable spaces such as commercial premises in this setting. Given that there were no Tier 1 HSL D exceedances, there is a low risk of vapour intrusion into commercial ground floor level spaces.

10.4 Groundwater

10.4.1 Guidelines

Concentrations of hydrocarbons in groundwater have been assessed against NEPM (2013) HSL's to determine potential risk to indoor receptors located at ground level only. Given there is no proposal for a basement, a groundwater depth class of 2 m bgs is applicable given groundwater depth below site ground floor founding level.

Groundwater HSL's are specific to each monitoring well and involves characterisation based on the following variables:

- The HSL's for surrounding properties (already identified);
- The dominant grain class overlying the hydrocarbon impacted groundwater based on US Agriculture Soil Classification System (SCS) and partitioning into either sand, silt or clay; and
- A depth class range is selected in accordance with the depth at which hydrocarbon impacted groundwater was intercepted (the closest DWS to the high PID reading). Classifying soil according to depth ranges: 0 to 1 m; 1 to 2 m; 2 to 4 m; and greater than 4 m;

Table 46 presents a summary of the principle lithologies intercepted above the water table (vadose zone) in each bore indicating the potential for vapour phase intrusion. Resulting threshold values for addressing HSL's are presented in the groundwater analytical results section of this report.

The highest PID values and the depth at which DWS are used as a reference point from which to interpret the dominant soil type in the vadose zone above the hydrocarbon impacted aquifer.

Table 46 Summary of Vadose Zone Lithology (above hydrocarbon impacted aquifer) based on USCS System

MW	Depth of PHC Impacted Groundwater[1]	Adopted HSL Depth Class (m)	Vadose Zone Geology (m thickness)										Adopted HSL Grain Class
			Pave-ment	CH	CL	MH	ML	SC	SM	ROCK	SW/ SP	GW/GP	
7116-01	2.91[2]	2-4	0.05					0.7	0.6			1.45	SAND
7116-02	2.7[1]	2-4	0.25		1.2						1.3	1.45	SAND
7116-03	2.8[1]	2-4	0.25		0.2				0.55		1.7		SAND
7116-04	2.9[1]	2-4	0.15		2.35					0.16			CLAY
7116-05	2.1[1]	2-4	0.25						0.95	1.85		0.15	CLAY

1 August 2017 GME
2 March 2016 GME

10.4.2 Findings

Groundwater sampling results Certificate of Analysis is presented in Appendix 7. Groundwater has been assessed against the elected NEPM ASC health screening levels (HSL) to determine potential hydrocarbon vapour risks to site users (Table 47 and Table 48).

Hydrocarbons have not been detected in any of the groundwater samples collected from either groundwater monitoring event.

Table 47 Summary of Groundwater Samples That Exceeded Threshold HSL Limits (March 2016)

					Benzene	Toluene	Ethylbenzene	Xylene	Naphthalene	F1	F2
Units					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR					<1	2	2	2	5	20	100
Monitoring Well	Groundwater Depth Class (m)	Grain Class	HSL								
7116-01	2 - 4	SAND	D	Limit	5000	NL	NL	NL	NL	6000	NL
				Result	<1	<2	<2	<2	<5	<20	<100
7116-02	4 - 8	CLAY	D	Limit	30000	NL	NL	NL	NL	NL	NL
				Result	<1	<2	<2	<2	<5	<20	<100
7116-04	2 - 4	CLAY	D	Limit	30000	NL	NL	NL	NL	NL	NL
				Result	<1	<2	<2	<2	<5	<20	<100
7116-05	2 - 4	SAND	D	Limit	5000	NL	NL	NL	NL	6000	NL
				Result	<1	<2	<2	<2	<5	<20	<100

Table 48 Summary of Groundwater Samples That Exceeded Threshold HSL Limits (August 2017)

					Benzene	Toluene	Ethylbenzene	Xylene	Naphthalene	F1	F2
Units					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR					<1	2	2	2	5	20	100
Monitoring Well	Groundwater Depth Class (m)	Grain Class	HSL								
7116-2	2 - 4	CLAY	D	Limit	30000	NL	NL	NL	NL	NL	NL
				Result	<1	<2	<2	<2	<5	<20	<100
7116-3	2 - 4	SAND	D	Limit	5000	NL	NL	NL	NL	6000	NL
				Result	<1	<2	<2	<2	<5	<20	<100
7116-4	2 - 4	CLAY	D	Limit	30000	NL	NL	NL	NL	NL	NL
				Result	<1	<2	<2	<2	<5	<20	<100
7116-5	2 - 4	SAND	D	Limit	5000	NL	NL	NL	NL	6000	NL
				Result	<1	<2	<2	<2	<5	<20	<100

#N/A - Requires alternative assessment approach if PHC identified ie. soil vapour assessment
NL – Non Limiting applicable as any derived HSL will exceed analyte solubility limit

10.4.3 Receptor Risk

A risk to indoor receptors from PVI from hydrocarbon impacted groundwater is not apparent based on the investigation. GES have not identified any soil with hydrocarbon impact which exceeds HSL guideline limits. The second phase of investigation around the apparent UST's (of which have not been located as yet) did not reveal any HSL exceedance in soil at a shallow depth or near the water table indicating an unlikely occurrence within the groundwater. This has been confirmed in the groundwater monitoring event, in which there are no HSL exceedances for assessing PVI risk to indoor receptors.

Analytical results and the extensive soil sampling indicate there is a very low chance of intercepting volatile hydrocarbon impact within soil at the site. This may be attributed to either:

- Predominance of heavy chain fuels (diesel and kerosene) used at the site; and
- Biodegradation of lighter hydrocarbon fractions which is consistent with the age of the tanks which are thought to exist at the site.

11 SOIL DISPOSAL ASSESSSMENT

11.1.1 Guidelines

Soil which is excavated from the site for landfill disposal is to be assessed against Information Bulletin 105 (IB105) for Classification and Management of Contaminated Soil for Disposal. The EPA uses 4 categories to classify contaminated soil as per Table 49:

- (Level 1) Fill Material;
- (Level 2) Low Level Contaminated Soil;
- (Level 3) Contaminated Soil; and
- (Level 4) Contaminated Soil.

Fixed numerical values are presented for soil concentrations and leachable fraction concentrations.

11.1.2 Findings

The soil samples have been compared against IB105 guidelines for soil disposal, refer to Table 50. The following conclusions have been made;

- Exceedances of barium, cadmium, copper, lead, manganese, mercury and zinc have been detected up to Level 2 however when these metal concentrations are averaged the soil is reduced to level 1 classification.
- Exceedances of lead have been detected up to Level 3 however when these metal concentrations are averaged the soil is reduced to level 1 classification.
- Exceedances of B(a)p, and the Sum of PAHs have been detected up to Level 4 however when these analyte concentrations are averaged the soil is reduced to level 3 classification.
- Exceedances of TRH (C^{10}-C^{36}) have been detected to Level 3 however when these metal concentrations are averaged the soil is reduced to level 2 classification.

Given the variation in soil classification across the site, GES recommends that all soil excavated at the site is stockpiled systematically, tested for contamination levels and transported to a licensed storage and handling facility for managing contaminated soil.

Table 49 Summary of IB105 Classification Guidelines

	Classification (with reference to Table 2)	Controlled Waste[1]	Comments
Fill Material[2] (Level 1)	Soil that exhibits levels of contaminants below the limits defined under *Fill Material* in Table 2.	Unlikely	Soil classified as *Fill Material* can still be a 'pollutant' under the *Environmental Management and Pollution Control Act 1994* and needs to be responsibly managed.
Low Level Contaminated Soil (Level 2)	Soil that exhibits levels of contaminants above the limits defined under *Fill Material* but below the limits defined under *Low Level Contaminated Soil* in Table 2.	Likely	Where leachable concentrations have not been prescribed, maximum total concentrations will be used to classify the soil.
Contaminated Soil (Level 3)	Soil that exhibits levels of contaminants above the limits defined under *Low Level Contaminated Soil* but below the limits defined under *Contaminated Soil* in Table 2.	Yes	Where leachable concentrations have not been prescribed, maximum total concentrations will be used to classify the soil.
Contaminated Soil for Remediation (Level 4)	Soil that exhibits levels of contaminants above the limits defined under *Contaminated Soil* in Table 2 (regardless of the maximum total concentrations) is generally ***not*** considered acceptable for off-site disposal without prior treatment.	Yes	Soil that contains contaminants that do not have criteria for leachable concentrations (*e.g.* petroleum hydrocarbons), and the levels of contaminants exceed the maximum total concentrations listed in *Contaminated Soil*, are generally classified as *Contaminated Soil for Remediation*.

[1] Controlled Waste is defined in the *Environmental Management and Pollution Control Act 1994*.
[2] Criteria for *Fill Material* are the limits set by the Director for the purposes of R.9(2)(a)(ii) in the *Regulations*.

Table 50 Soil Analytical Results Compared Against IB105 Investigation Limits for soil Disposal, March 2016 and August 2017

Information Bulletin 105 Classification and Management of Contaminated Soil For Disposal		EG005T: Total Metals by ICP-AES											EG035T: Total Rec			EP080: BTEX				EP080/071: TRH	
		Arsenic	Barium	Beryllium	Cadmium	Chromium Total	Cobalt	Copper	Lead	Manganese	Nickel	Zinc	Mercury	Benzo(a)pyrene	Sum of polycyclic aromatic hydrocarbons	Benzene	Toluene	Ethylbenzene	Total Xylenes	C6 - C9 Fraction	C10 - C36 Fraction (sum)
Unit		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR		5	10	1	1	2	2	5	5	5	2	5	0.1	0.5	0.5	0.2	0.5	0.5	0.5	10	50
Investigation Level Selected																					
IB105 Level 1		20	300	2	3	50	100	100	300	500	60	200	1	0.08	20	1	1	3	14	65	1000
IB105 Level 2		200	3000	40	40	500	200	2000	1200	5000	600	14000	30	2	40	5	100	100	180	650	5000
IB105 Level 3		750	30000	400	400	5000	1000	7500	3000	25000	3000	50000	110	20	200	50	1000	1080	1800	1000	10000
IB105 Level 4		>750	>30000	>400	>400	>5000	>1000	>7500	>3000	>25000	>3000	>50000	>110	>20	>200	>50	>1000	>1080	>1800	>1000	>10000
4/08/2017	BH14 0.5-0.6	12	120	<1	<1	17	17	92	227	373	23	146	0.6	27.2	266	<0.2	<0.5	<0.5	<0.5	<10	1830
4/08/2017	BH14 2.5-2.6	<5	<10	<1	<1	5	10	6	12	135	9	26	<0.1	<0.5	1.3	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH15 0.5-0.6	<5	90	<1	<1	12	16	109	125	279	16	99	0.2	21	217	<0.2	<0.5	<0.5	<0.5	<10	1300
4/08/2017	BH15 2.5-2.6	<5	70	<1	<1	9	9	44	126	245	8	44	1.1	0.7	7.1	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH16 0.5-0.6	<5	130	<1	<1	12	19	73	192	326	15	157	1.6	27	354	<0.2	<0.5	<0.5	<0.5	<10	1910
4/08/2017	BH16 2.5-2.6	<5	80	<1	<1	8	8	24	91	153	8	23	0.2	2.6	40.9	<0.2	<0.5	<0.5	<0.5	<10	120
4/08/2017	BH17 0.5-0.6	<5	80	<1	2	5	7	78	1270	277	8	527	0.2	24.6	178	<0.2	<0.5	<0.5	<0.5	<10	3730
4/08/2017	BH17 2.5-2.6	<5	60	<1	<1	9	8	38	46	237	8	23	0.6	0.8	19.3	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH18 0.5-0.6	<5	80	<1	3	10	15	62	1600	434	13	314	0.3	30.4	407	<0.2	<0.5	<0.5	<0.5	<10	2190
4/08/2017	BH18 2.1-2.2	<5	30	<1	<1	9	15	15	45	160	12	75	0.1	2.3	40.6	<0.2	<0.5	<0.5	<0.5	<10	140
4/08/2017	BH19 0.5-0.6	7	180	<1	<1	17	13	121	425	323	14	542	4.3	10.9	108	<0.2	<0.5	<0.5	<0.5	<10	950
4/08/2017	BH19 2.5-2.6	<5	40	<1	<1	4	3	8	10	120	4	5	<0.1	<0.5	1.2	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH20 0.5-0.6	<5	70	<1	<1	4	11	50	80	593	16	71	0.1	2.5	23.8	<0.2	<0.5	<0.5	<0.5	<10	130
4/08/2017	BH20 2.5-2.6	<5	1660	<1	<1	26	22	54	14	249	20	24	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
4/08/2017	BH21 0.5-0.6	<5	120	<1	<1	12	11	68	249	376	15	237	0.5	90.1	1590	<0.2	<0.5	<0.5	<0.5	<10	6090
4/08/2017	BH21 2.1-2.2	<5	80	<1	<1	14	14	39	67	178	12	52	1.2	7.2	134	<0.2	<0.5	<0.5	<0.5	<10	480
4/08/2017	BH22 0.5-0.60	<5	190	<1	<1	30	29	68	<5	546	31	18	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH01 0.4-0.8m	<5	90	<1	<1	13	16	63	83	274	15	100	0.2	79.9	676	<0.2	<0.5	<0.5	<0.5	<10	4220
15/03/2016	TH01 2.5-2.6m	8	90	<1	<1	31	14	57	52	224	25	43	0.1	1.3	13.8	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH01 4.2-4.5m	7	80	<1	<1	14	11	56	109	234	15	109	0.2	77.7	871	<0.2	<0.5	<0.5	<0.5	<10	3290
15/03/2016	TH02 0.4-0.8m	<5	50	<1	<1	5	32	68	67	142	11	181	<0.1	30.4	292	<0.2	<0.5	<0.5	<0.5	<10	2010
15/03/2016	TH03 0.5-0.6m	<5	20	<1	<1	4	2	7	8	90	3	19	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH03 1.5-1.6m	<5	180	<1	<1	6	28	35	9	32	24	31	<0.1	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH03 3.2-3.4m	<5	10	<1	<1	6	2	<5	<5	46	4	12	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH04 0.5-0.6m	<5	110	<1	<1	12	8	69	162	315	17	337	0.2	10.2	66.1	<0.2	<0.5	<0.5	<0.5	<10	470
15/03/2016	TH04 3.5-3.6m	6	10	<1	<1	8	4	8	11	51	7	20	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH05 0.5-0.6m	<5	30	<1	<1	13	16	65	5	769	25	40	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH05 2.0-2.1m	<5	40	<1	<1	15	14	90	49	620	22	52	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH06 0.5-0.6m	<5	140	<1	<1	27	23	65	<5	373	29	22	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH05 4.5-4.6m	<5	80	<1	<1	16	17	18	6	159	12	14	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	TH06 2.0-2.1m	<5	80	<1	<1	17	13	57	28	434	22	48	0.1	0.6	3.1	<0.2	<0.5	<0.5	<0.5	<10	140
15/03/2016	TH06 4.5-4.6m	<5	<10	<1	<1	6	4	<5	<5	46	4	9	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	BH07 0.4-0.5m	<5	120	<1	3	10	11	56	404	281	13	305	0.4	81.1	636	<0.2	<0.5	<0.5	<0.5	<10	4260
15/03/2016	BH07 3.3-3.4m	<5	50	<1	<1	11	9	22	36	102	9	28	0.6	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH08 0.5-0.6m	<5	150	<1	<1	13	24	43	13	231	18	37	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH08 2.5-2.6m	<5	280	<1	<1	30	16	56	<5	413	25	10	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH09 0.4-0.5m	<5	30	<1	<1	21	9	18	7	57	10	13	<0.1	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH10 0.4-0.5m	<5	80	<1	<1	13	11	52	208	500	12	176	0.4	116	1070	<0.2	<0.5	<0.5	<0.5	<10	3570
16/03/2016	BH11 0.4-0.5m	14	130	<1	2	22	15	61	196	352	34	566	3.2	6.4	44.8	<0.2	<0.5	<0.5	<0.5	<10	390
16/03/2016	BH11 2.7-2.8m	<5	40	<1	<1	8	10	76	158	237	10	135	0.1	4.7	35.9	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH12 0.3-0.4m	<5	80	<1	<1	8	11	18	488	237	9	421	0.1	3.4	27.6	<0.2	<0.5	<0.5	<0.5	<10	380
16/03/2016	BH12 1.5-1.6m	<5	120	<1	<1	24	25	114	46	502	22	383	0.1	3.5	26.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH12 2.9-3.0m	7	480	1	<1	16	44	43	24	200	52	45	0.2	1.5	22.5	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH13 0.3-0.4m	<5	120	1	<1	13	16	13	45	342	12	66	<0.1	<0.5	2	<0.2	<0.5	<0.5	<0.5	<10	<50
16/03/2016	BH13 1.0-1.1m	<5	130	<1	<1	12	10	16	69	189	9	50	0.3	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	BH10 2.1-2.2m	<5	30	<1	<1	22	15	27	18	147	16	28	0.1	2.5	50.2	<0.2	<0.5	<0.5	<0.5	<10	<50
15/03/2016	BH10 3.4-3.5m	<5	60	<1	<1	15	10	36	79	175	10	73	0.6	57.2	1300	2.6	4.4	<0.5	9.7	24	3240
Averaging		1.259	142.22	0	0.19	11.52	13.41	49.63	192.48	248.48	13.52	122.33	0.44	16.7	199	0.01	0	0	0	0	1077.04

12 CONCEPTUAL SITE MODEL

12.1 Overview of Impacts

A conceptual model has been generated for the site illustrating the main source, transport, exposure media and receptors identified at the site. The greatest risk is present in Zone C and Zone E and potentially at depth in Zone B. These areas are the locations where the fill is expected to have been dumped into the historical Hobart Town Rivulet channel, refer to Figure 7. Receptor risks identified at the site include:

- Trench worker dust inhalation or soil ingestion risk to PAH compounds and lead in soil;
- Trench worker inhalation of volatilized ambient PHC's from residual hydrocarbons within UST's which may be excavated/uncovered during site foundation works; and
- Ecological Receptor risk via Groundwater transport of heavy metals and UST leaching.

12.2 Potential & Identified Sources of Contamination

12.2.1 Potential Primary Sources

The primary potential sources of contamination impact at the site includes:

- UST T1, T2, T3 and T4 and associated bowsers and fuel lines;
- Tanning operations in zone B & C;
- Historical garage/tram workshop in zone D & E;
- Soap and candle making in zone F; and
- Infilling of the former Hobart Town Rivulet in Zone C and potentially at depth in zone B.

There may be other unknown potential sources of onsite or offsite impact (outside of the sampling areas) which GES are unaware of and therefore have not been investigated within this assessment.

Contaminates of potential concern associated with these potential sources have already been identified in a previous section.

12.2.2 Identified Secondary Sources

The exact source of the impact is not known. The following contaminants have been identified:

- PAH, from an unknown origin, but occurring either from PAH impacted fill which is common in the area or historical site use as a vehicle service center where PAH containing fuels or oils may have been used and where gasworks waste may have been dumped; and
- Heavy metals within the fill (primarily lead).

12.3 Potential Receptors

The following presents a summary of all potential receptors considered in the assessment.

12.3.1 Potential Waterway/River Impact

GES have identified that the site does not present a risk to drinking water quality given that groundwater has been ruled out as a PEV based on high salinity. Other PEV's including industrial use, stock watering and irrigation have been ruled out leaving ecosystem as a PV which needs to be considered.

In its current use, there is a low risk that the flagged soil EIL's and EIL's exceedances will present a risk to the receiving ecosystem receptor – being Victoria Dock downgradient of the former Hobart Town Rivulet alignment and potentially Hobart Rivulet. Groundwater results from both monitoring rounds indicate exceedances for heavy metals but not PAH's. It is possible that the heavy metal impact identified in groundwater at the site sources from upgradient.

It is unlikely that groundwater will impact stormwater within the now enclosed Hobart Rivulet given the calculated likely mass loading rates.

12.3.2 Potential Future Onsite Receptors

Potential future onsite receptors including slab demolition, earth removal, development and occupancy stages. Receptors therefore include ground floor commercial workers and above ground residence.

Potential future onsite receptors are presented in Table 51.

Table 51 Summary of Potential Future Onsite Receptors

Medium	Specific Onsite Receptor
Soil Impact	Future site commercial workers involved soil removal – redevelopment phase
	Future trench workers – ongoing – limited to excavations greater than 1m bgs
	Future onsite inhabitants - ground floor commercial workers

12.3.3 Excluded Receptors

There is a low risk that groundwater will present a health concern to site workers unless it has been mixed with shallow impacted fill material.

12.3.4 Potential Offsite Receptors

The chance of PAH and possibly heavy metal dispersal from the site is largely dependent on how the site redevelopment work is managed. Heavy metals and PAH compounds are not expected to concentrate further but may be mobilized particularly within surface waters during storm events. Table 52 presents a summary of potential offsite receptors

Table 52 Summary of Potential Offsite Receptors

Medium	Specific Offsite Receptor
Shallow Soil & Surface Water Drainage	Public and residential receptors downgradient of the site – during development only.
Soil/groundwater	Ecological receptors – leaching & surface water/soil runoff – Victoria Dock – River Derwent.

12.4 Transport Mechanisms and Exposure Routes

12.4.1 Incomplete Contaminant Exposure Pathways

Incomplete contaminant exposure pathways relate to present unmanaged risk. Table 53 presents a summary of potential receptors identified with incomplete exposure pathways deducted based on site desktop assessment or soil analysis. Exposure pathways ruled out are risk to future site commercial users given no HSL D vapour intrusion exceedances have been identified (from both groundwater and soil analysis) and limited opportunity for access to impacted soil beneath ground level new clean imported fill and the slab.

Table 53 Summary of Incomplete Contaminant Exposure Pathways

Medium	Specific Receptor	Pathways Ruled Out	Basis
Soil	Future site habitants - commercial receptors	Vapour Inhalation	No HSL exceedances in soil
	Future site habitants - commercial receptors	Dermal contact Dust inhalation Soil Ingestion	Limited opportunity for access to soil given 100% sealed ground at floor level.

12.4.2 Potential Pathways

During site development works, potential transport mechanisms and exposure routes identified relating to human health include:

- Dust generation and specifically lead and PAH impacted soil being inhaled by onsite commercial workers and surrounding public/residential receptors;
- Impacted soil and impacted stormwater mobilization during storm events; and
- PAH and lead impacted soil being ingested.

During this phase, there is a potential pathway for shallow impacted soil (exceeding ESL's and EIL's) to enter the marine environment through the following pathways:

- Poor control of impacted surface soils/water eroding and washing into storm water network; and
- Direct leaching of impacted soil into the groundwater and into the marine environment along the former Hobart Town Rivulet alignment.

Similarly, during storm events, impacted soil and surface waters have the potential to migrate into neighboring properties.

Provided that a contamination management plan (CMP) is put in place, there is unlikely to present a risk and become a plausible contaminant exposure pathway. Specific recommendations pertaining to these risks have been compiled into a CMP document which is to accompany this document.

Following site development works, there may remain a low risk to trench workers if excavations are deeper than 1m bgs. Ongoing risks are attributed to soil ingestion and dust inhalation hazards; if a contamination management plan is adopted the risk will be mitigated.

Potential complete exposure pathways identified at the site are presented in Table 54.

Table 54 Summary of Potential Complete Contaminant Exposure Pathways

Medium	Specific Pathway	Receptors
Soil	Soil removal – redevelopment phase	Future site commercial workers
	Soil removal – trench workers	Future trench workers
	Dust generation from the site – redevelopment phase	Public receptors
Soil/groundwater	Surface water/soil runoff	Ecological receptors
	Leaching	

* See Recommendations for Managed Risk Options

12.4.3 Plausible Contaminant Exposure Pathway Details

Provided that the soil is adequately managed as indicated in the recommendations and the CMP, plausible exposure pathways to humans are not identified at the site.

Surface water/soil runoff may be managed at the site, provide appropriate engineering measures are put in place to limit erosion and discharge during a heavy rainfall event. Marine ecosystem impact has been identified as a plausible but low risk pathway given revised groundwater mass loading calculations, refer to Figure 13.

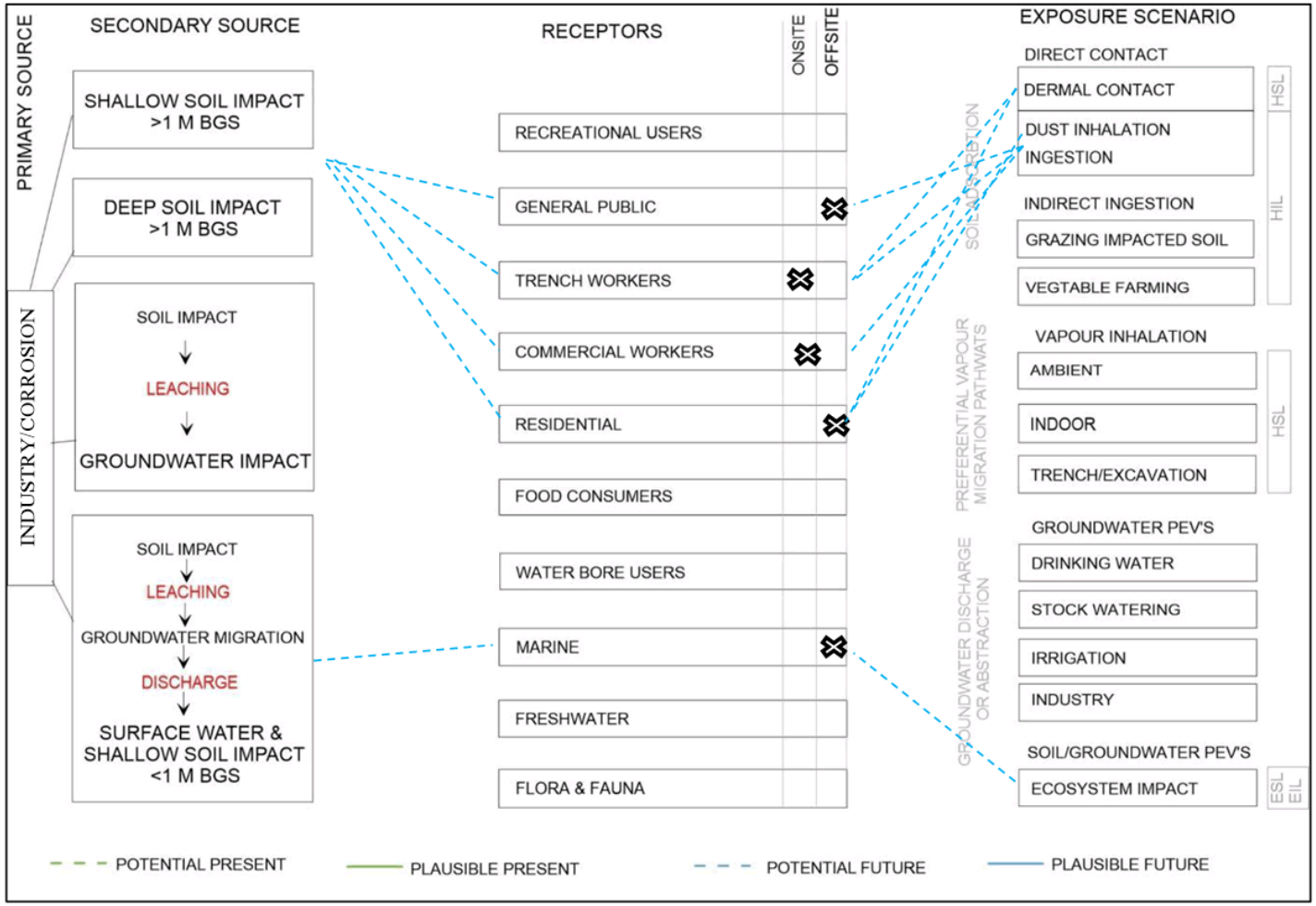


Figure 13 Conceptual Site Model Identifying Contamination Source, Receptors and Transport Mechanisms/Exposure Route

13 CONCLUSIONS

The following can be concluded from the site assessment:

- Uncontrolled fill was encountered across most of the site to depths of greater than 3.3 m bgs with the deepest fill apparent in the center of the site along a former Hobart Town Rivulet alignment. Fill comprised of mixed alluvial type clay, silt, sand and gravel sediments with occasional bricks. Natural underlying sediments comprised of clay, silt and sand;
- One UST was confirmed present on site and two suspected abandoned UST's could not be located during the investigation. The second phase of investigation did not provide any evidence of hydrocarbon impact which could be used to trace the location of any of the UST's;
- As there are no decommissioning records for the UST's on site there are possibly two or more unidentified UST's still present on the site which will require adequate handling and disposal in accordance with EPA regulations;
- BTEX compounds were present in low concentrations in an isolated onsite bore indicating there may have been historical product release. There is a chance that soil and groundwater surrounding the UST's may have minor hydrocarbon impact which will need to be managed and disposed of;
- Groundwater flow directions were discerned to be directed towards the center of the site at a very shallow gradient towards the original Hobart Town Rivulet stream channel to the southeast and the revised Hobart Rivulet. Groundwater migrating from the site is likely to follow the path of least resistance and travel in an southeasterly direction towards Victoria Dock. Groundwater fate calculations have determined that there is a low rick that significant volumes of groundwater (several milliliters per second) will enter the revised rivulet alignment;
- Volatile hydrocarbon contaminants such as BTEX, naphthalene and C_6 to C_{16} have not been identified in high concentrations (sufficient to impact groundwater). Vapour intrusion risk is identified as low given the proposed land used;
- The excavation of soil for installation of footings and service trenches is likely to unearth PAH and potentially lead affected soils on the site, which will need to be handled through application of a contamination management plan which should include dust suppression strategies. Soil will require classification according to EPA IB 105;
- Given that the proposed future ground floor is expected to be entirely paved and sealed, there is expected to be limited opportunity for exposure to future site commercial workers;
- An indoor vapour intrusion risk is not apparent at the site based on the proposed development involving a ground floor commercial space.
- The most significant management issue at the site is therefore the presence of hydrocarbon (PAH) and heavy metal contamination in shallow fill underlying the surface of site. Removal of existing site surfaces may result in mobilization of hydrocarbons and metals towards neighboring properties and stormwater systems during storm events. As detailed in a CMP, stormwater will need to be collected, stored and collected prior to offsite disposal. A soil and water management plan will need to be put in place to manage site erosion risks. Similarly, during dry conditions, impacted soil may become an airborne creating a dust inhalation hazard which will need to be managed in a CMP.
- The concentration of all IB105 compounds analysed at the site average out to level 1 except for:
    - TRH C10-C36 which is level 2;
    - Total PAH is level 3; and
    - Benzo(a)pyrene is level 3.
- The Sullivan's Cove Planning Scheme 1997, Schedule 8 states that: *the applicant is to provide information to demonstrate that an appropriate level of cleanup of the site it to occur. Alternatively, the applicant is to demonstrate that the proposed activity will not result in an immediate or likely long term hazard to human health or the environment*. GES can confirm once the development is complete and the site is 100% sealed, there will be;
    - No opportunity for exposure to soil contamination by commercial workers or guest to the property, thus mitigating the human health risk; and

- No opportunity for the infiltration of rainwater to mobilise metals or PAH's into the groundwater and/ or the marine environment.
- Minimal risk posed by site contamination to the environment

14 RECOMENDATIONS

The primary concerns at the site which need to be managed include:

- There is a low risk that soils may leach and enter the marine environment,
- A moderate to high risk that impacted surface waters and soil may flush offsite into neighboring properties and into the waterways during storm events;
- Management of onsite workers to limit health risks from:
    - Potential dermal contact with hydrocarbon impacted soil;
    - Ingestion of soil or inhalation of dust contaminated with lead or PAH compounds.
    - Management of dust to prevent transport towards surrounding residences and public; and
    - The potential that shallow impacted soil may be unearthed by future trench workers.

The following management approaches are recommended:

- Producing a Contamination Management Plan (CMP) to minimize the above health and environmental risks; and
- Anecdotally, cyanide gasses have been identified in gasworks waste in the area. Precautions need to be put in place to ensure the risks are appropriately managed through soil, groundwater and gas monitoring;
- The underground fuel storage tanks identified in the workplace standard records will require decommissioning according to EPA regulations as part of site redevelopment works.

A CMP is required for the demolition, excavation and construction phases of the proposed development. The following considerations should be included in the CMP:

- During excavation, there needs to be close consideration to minimise the amount of time that any excavated soil is exposed;
- Given the above may be difficult to limit, the following are recommended:
    - Installing a perimeter drain around the site and diverting all surface water to a sump before being pumped into temporary storage vessels for regulate disposal to an approved offsite facility. Timely testing (allowing for a 5-day delay) will be required to test the water to discern the best disposal option for the water;
    - Runoff risk will remain in place until a final concrete surface covering is put in place over the site. This includes the period when the site has been infilled to the proposed bottom of slab level when water will continue to percolate and discharge offsite. Subsurface perimeter drains should remain active, and the sump should remain up to the final stage of slab preparations works.
    - A soil and water management plan will need to be put in place which detail measures to be put in place to manage offsite migration of hydrocarbon and heavy metal impacted soil;
    - Ensuring that dust barriers are put in place to limit offsite migration of excavated soils;
    - Standard procedures to minimize dust creation;
    - General PPE controls;
- Crushed bedrock should be kept separate to the fill material to minimise disposal cost of contaminated material; and
- Given the historical industrial nature of the site, all excavated soil at the site is to be stockpiled systematically, tested for contamination and results are to be compared against IB105 guidelines and managed appropriately. The upper meter of the site is shown to be consistently impacted, and consideration should be given to storing shallow soil separately to minimize offsite disposal costs.

If the CMP is adhered to, GES concludes that there is a low risk that soil with elevated concentrations of contaminants will become exposed to sensitive receptors. Key points to be identified within the CMP include:

- Standard building site security fencing should be constructed to ensure that sensitive receptors do not have access to the exposed soil during construction;
- It is recommended that stockpiled fill material is covered as soon as practicable to ensure that the material is not left to dry out and become airborne because of wind or general earthworks disturbance;
- A physical separation layer is recommended in areas where there is ground disturbance. The CMP should be referred to for specifics on defining disturbed areas and measures to be put in place to remediate disturbed ground. This may include areas outside of the identified investigation areas.
- Unless areas are known to have been topped with clean fill, as a general recommendation, areas that are prone to drying out should either be moderately irrigated to prevent dust being generated or investigated with further soil testing to assess the need for further physical separation barriers.
- A soil and water management will need to be put in place which should initiate as soon as surface removal occurs until the site is finally paved with the ground level slab. An assumption needs to be made than all water and soil residing on the surface of the site is impacted and needs to be appropriately managed. The soil and water management plan needs to detail likely pathways where surface water will migrate and where erosion is likely. All surface water migrating to the perimeter of the site will need to be collected and disposed offsite at an approved facility.
- The proposed site works present a very low human health risk to future users of the site; and GES advise that during the site redevelopment, there is a low risk that site contamination will present an environmental risk.
- Following development of the site the existing soil contamination also poses a low risk of harm to human or environmental receptors as the construction and sealed nature of the site prevents any pathway-receptor links.

Yours faithfully,

Kris J Taylor BSc (Hons)
Environmental Geologist

Yours faithfully,

Sarah Joyce BSc (Hons)
Environmental Geologist

REFERENCES

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LIMITATIONS STATEMENT

This monitoring Report has been prepared in accordance with the scope of services between Geo-Environmental Solutions Pty. Ltd. (GES) and Fragrance TAS – HOBART (Collins) Pty Ltd ('the Client'). To the best of GES's knowledge, the information presented herein represents the Client's requirements at the time of printing of the Report. However, the passage of time, manifestation of latent conditions or impacts of future events may result in findings differing from that described in this Report. In preparing this Report, GES has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations referenced herein. Except as otherwise stated in this Report, GES has not verified the accuracy or completeness of such data, surveys, analyses, designs, plans and other information.

The scope of this study does not allow for the review of every possible soil and groundwater contaminant over the whole area of the site. Samples collected from the investigation area are assumed to be representative of the areas from where they were collected and indicative of the contamination status of the site at that point in time. The conclusions described within this report are based on these samples, the results of their analysis and an assessment of their contamination status.

This report does not purport to provide legal advice. Readers of the report should engage professional legal practitioners for this purpose as required.

No responsibility is accepted for use of any part of this report in any other context or for any other purpose by third party.

Appendix 1 GES Staff and Qualifications

Geo-Environmental Solutions (GES) is a specialist geotechnical and environmental consultancy providing advice on all aspects of soils, geology, hydrology, and soil and groundwater contamination across a diverse range of industries.

Geo Environmental Solutions Pty Ltd:

- ACN – 115 004 834
- ABN – 24 115 004 834

GES STAFF - ENGAGED IN SITE INVESTIGATION WORKS

Dr John Paul Cumming B.Agr.Sc (Hons) Phd CPSS GAICD

- Principle Author and Principle Environmental Consultant
- PhD in Environmental Soil Chemistry from the University of Tasmania in 2007
- 12 years' experience in environmental contamination assessment and site remediation.

Ms Sarah Joyce BSc (Hons)

- Senior Environmental Scientist
- Honours in Geography and Environmental Science at the University of Tasmania in 2003;
- Undergraduate Degree Double Major in Geology and Geography & Environmental Science
- 15 years professional work experience and six years contaminated site assessment

Mr Kris Taylor Bsc (Hons)

- Senior Environmental & Engineering Geologist
- Honours in Environmental Geology at the University of Tasmania in 1998
- 15 years' experience in environmental contamination assessments and hydrogeology (including honours in mine site tailing pollution assessment)

Mr Grant McDonald (Adv. cert. hort.)

- Soil Technician
- 6 years' experience in hydrocarbon and heavy metal contamination sampling of soils and groundwater.

Mr Aaron Plummer(Cert. IV)

- Soil Technician
- 3 years' experience in hydrocarbon and heavy metal contamination sampling of soils and groundwater.

Appendix 2 Soil & Groundwater Chain of Custody (COC)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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PROJECT:	2 Collins Street	ALS QUOTE NO.:	N/A
ORDER NUMBER:			COC SEQUENCE NUMBER (Circle): GOC: 1 2 3 4 5 6 7; CA: 1 2 3 4 5 6 7
PROJECT MANAGER:	Sarah Joyce	CONTACT PH:	0438255259
SAMPLER:	Aaron Plumber	SAMPLER MOBILE:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):	
Email Reports to:	sjoyce@geosolutions.net.au jcumming@geosolutions.net.au		
Email Invoice to:	jcumming@geosolutions.net.au		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 1 50 pm 7/8/17	DATE/TIME:	DATE/TIME:	DATE/TIME: 8/8/17 11:45 (ALS)

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

	SAMPLE DETAILS (MATRIX: Solid(S) Water(W))			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price)							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX/PAH	15 Metals	Heavy Metals	TPH, BTEX	HOLD	[redacted]		
1	7116-2	7/8/17	W	1xAG, 1xP, 2xVS	4	✓	✓	✓					
2	7116-3					✓	✓	✓					
3	7116-4					✓	✓	✓					
4	7116-5					✓	✓	✓					
5	DUP					✓	✓	✓					
6	Rinsate 2			2xVS, 1AG	3				✓				
7	Trip blank			2xVS	2				✓				
8	Rinsate 1	4/8/17	W	2xVS, 1AG	3				✓				
9	BH14 0.5-0.6		S	1 Soil Jar	1	✓	✓						
10	BH14 1.5-1.6				1					✓			
11	BH14 2.5-2.6				1	✓	✓						
12	BH15 0.5-0.6				1	✓	✓						
				TOTAL									

Environmental Division
Melbourne
Work Order Reference
EM1710504

Telephone : +61-3-8549 9600

FREIGHT

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PROJECT:	2 Collins Street	ALS QUOTE NO.:	N/A
ORDER NUMBER:			COC SEQUENCE NUMBER (Circle): COC: 1 (2) 3 4 5 6 7; OF: 1 2 (3) 4 5 6 7
PROJECT MANAGER:	Sarah Joyce	CONTACT PH:	0438255259
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DATE/TIME: 150pm 7/8/17	DATE/TIME:	DATE/TIME:	Bharathi (ALS) DATE/TIME: 8/8/17 11.45a

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

	SAMPLE DETAILS MATRIX: Soil(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX/PAH	15 Metals			HOLD			
13	BH15 1.5-1.6	4/8/17	S	1 Soil Jar	1					✓ HOLD			
14	BH15 2.5-2.6					✓	✓						
15	BH16 0.5-0.6					✓	✓						
16	BH16 1.5-1.6									✓			
17	BH16 2.5-2.6					✓	✓						
18	BH17 0.5-0.6					✓	✓						
19	BH17 1.5-1.6									✓			
20	BH17 2.5-2.6					✓	✓						
21	BH18 0.5-0.6					✓	✓						
22	BH18 1.5-1.6									✓			
23	BH18 2.1-2.2					✓	✓						
24	BH19 0.5-0.6	↓	↓	↓	↓	✓	✓						
					TOTAL								

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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DATE/TIME: 1:50pm 7/8/17	DATE/TIME:	DATE/TIME:	Bhavathi (ALS) DATE/TIME: 8/8/17 11:45

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX/PAH	15 Metals			HOLD				Additional Information
25	BH19 1.5-1.6	4/8/17	S	1 Sol Jar	1					✓				
26	BH19 2.5-2.6					✓	✓							
27	BH20 0.5-0.6					✓	✓							
28	BH20 1.5-1.6									✓				
29	BH20 2.5-2.6					✓	✓							
30	BH21 0.5-0.6					✓	✓							
31	BH21 1.5-1.6									✓				
32	BH21 2.1-2.2					✓	✓							
33	BH22 0.5					✓	✓							
34	Dup 1					✓	✓							
35	Dup 2					✓	✓							
					TOTAL									

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☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176 Ph 02 8784 8555 E:samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph 02 4968 9433 E:samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph 07 3243 7222 E:samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph 07 4796 0600 E:townsville.environmental@alsenviro.com
★ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph 03 8549 9600 E:samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph 08 8359 0890 E:adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph 08 9209 7655 E:samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph 03 6331 2158 E:launceston@alsenviro.com

FREIGHT

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PROJECT MANAGER: JP Cumming
SAMPLER: A Plummer
SAMPLER MOBILE: 0400 821 977
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☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: N/A

COC SEQUENCE NUMBER (Circle)
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OF: 1 2 3 4 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
A Plummer			Marra (ALS)
DATE/TIME: 16/3/16	DATE/TIME:	DATE/TIME:	DATE/TIME: 17/3, 9-05

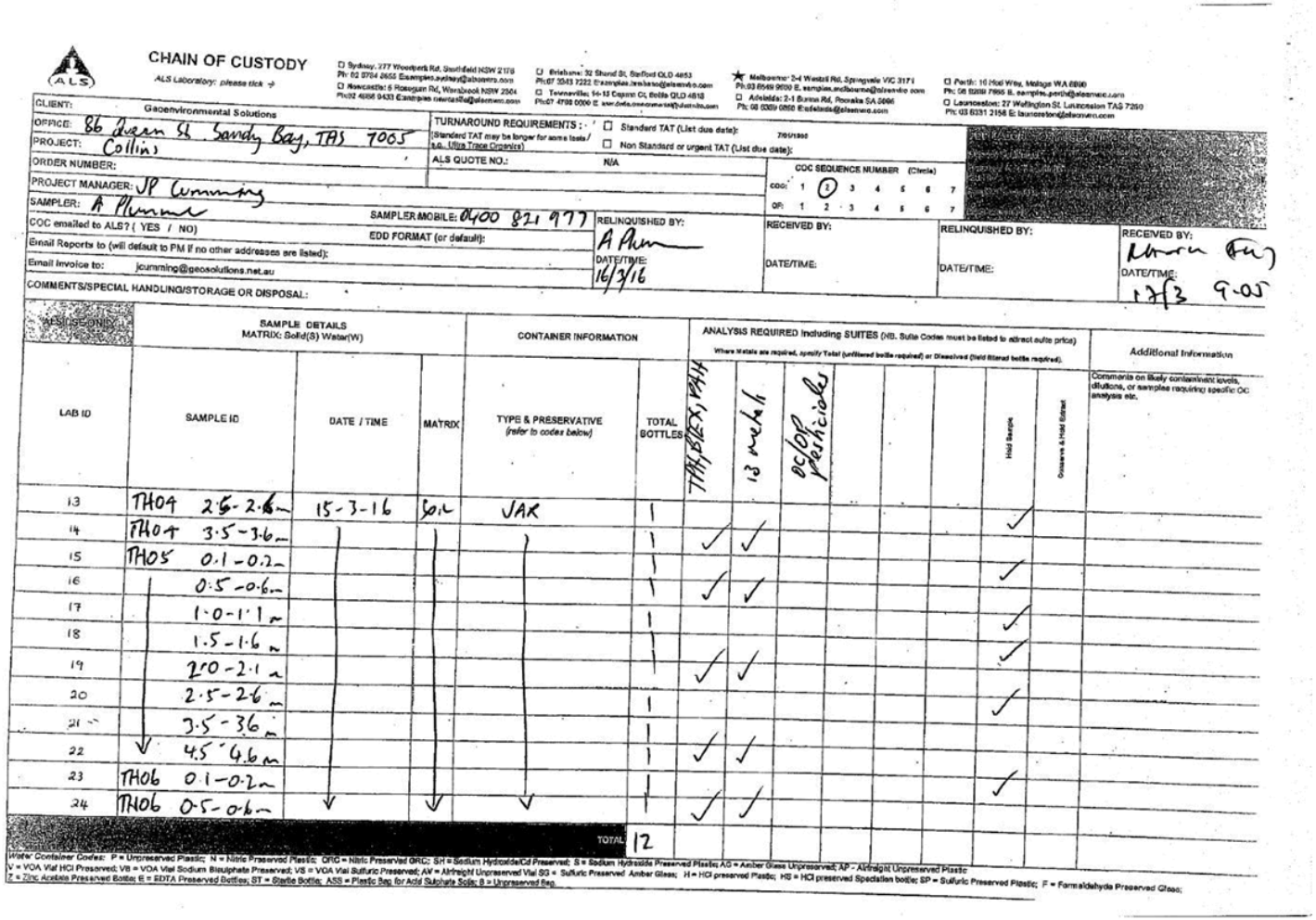
ALS USE ONLY | SAMPLE DETAILS MATRIX: Solid(S) Water(W) | CONTAINER INFORMATION | ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). | Additional Information

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH, BTEX, PAH	13 metals	OC/OP pesticides					Hold Sample	Conserve & Hold Extract	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	TH01 0.4-0.8m	15-3-16	SOIL	JAR	1	✓	✓								
2	TH01 1.5-1.8m				1								✓		
3	2.5-2.6m				1	✓	✓								
4	3.5-3.8m				1								✓		
5	4.2-4.5m				1	✓	✓								
6	BH TH02 0.4-0.8m				1	✓	✓								
7	TH03 0.5-0.6m				1	✓	✓								
8	1.5-1.6m				1	✓	✓								
9	2.6-2.8m				1								✓		
10	3.2-3.4m				1	✓	✓								
11	TH04 0.5-0.6m				1	✓	✓								
12	TH04 1.5-1.6m				1								✓		
				TOTAL	12										

Environmental Division
Melbourne
Work Order Reference
EM1602834

Telephone : + 61-3-8549 9600

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag



CHAIN OF CUSTODY

ALS Laboratory: please tick →

Sydney, 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4958 9433 E:samples.newcastle@alsenviro.com
Brisbane: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: ww.jobs.enviromental@alsenviro.com
Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Geoenvironmental Solutions		
OFFICE:	86 Doorn St Sandy Bay, TAS 7005	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests / e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): 7/01/1900 ☐ Non Standard or urgent TAT (List due date):
PROJECT:	Collins		
ORDER NUMBER:		ALS QUOTE NO.: N/A	COC SEQUENCE NUMBER (Circle) COC: 1 (2) 3 4 5 6 7 OP: 1 2 3 4 5 6 7
PROJECT MANAGER:	JP Cumming		
SAMPLER:	A Plumm	SAMPLER MOBILE: 0400 821 977	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):	RELINQUISHED BY: A Plumm DATE/TIME: 16/3/16
Email Reports to (will default to PM if no other addresses are listed):			RECEIVED BY: DATE/TIME:
Email Invoice to:	jcumming@geosolutions.net.au		RELINQUISHED BY: DATE/TIME:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:			RECEIVED BY: DATE/TIME: 17/3 9.05

ALS use only	SAMPLE DETAILS Matrix: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TRH/BTEX/VOC/HAH	13 metals	OC/OP pesticides				Hold Sample	Cyanide & Hold Extract	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	TH04 2.5-2.6m	15-3-16	Soil	JAR	1							✓		
14	TH04 3.5-3.6m				1	✓	✓							
15	TH05 0.1-0.2m				1							✓		
16	0.5-0.6m				1	✓	✓							
17	1.0-1.1m				1							✓		
18	1.5-1.6m				1							✓		
19	2.0-2.1m				1	✓	✓							
20	2.5-2.6m				1							✓		
21	3.5-3.6m				1									
22	4.5-4.6m				1	✓	✓							
23	TH06 0.1-0.2m				1							✓		
24	TH06 0.5-0.6m				1	✓	✓							
				TOTAL	12									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY
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☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
★ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Geoenvironmental Solutions	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	66 Queen St, Sandy Bay, TAS 7005		FOR LABORATORY USE ONLY (Circle)
PROJECT:	Collins	ALS QUOTE NO.:	
ORDER NUMBER:		COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT MANAGER:	JP Cumming		
SAMPLER:	A Plummer	SAMPLER MOBILE: 0400 821 977	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):			
Email Invoice to:	jcumming@geosolutions.net.au		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME: 17/3 9-05

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX/PAH	13 metals	OCP/OPP pesticides				Hold Sample	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	TH06 2.0-2.1m	15-3-16	Soil	JAR	1	✓	✓						
26	2.5-2.6m				1							✓	
27	3.0-3.1m				1							✓	
28	3.5-3.6m				1							✓	
29	4.0-4.1m				1							✓	
30	4.5-4.6m				1	✓	✓						
31	BH07 0.4-0.5m				1	✓	✓						
32	BH07 2.6-2.7m				1							✓	
33	BH07 3.3-3.4m				1	✓	✓						
34	BH08 0.2-0.3m	16-3-16			1			✓				✓	
35	0.5-0.6m	16-3-16			1	✓	✓	✓					
36	1.0-1.1m	16-3-16	✓		1							✓	
				TOTAL	12								

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental Site Assessment – Version 8 – 2 Collins Street. 26 July2018

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com
☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
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☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: Geoenvironmental Solutions	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: 86 Queen St, Sandy Bay, TAS 7005			
PROJECT: Collins	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 (4) 5 6 7 OF: 1 2 3 4 5 6 7	
ORDER NUMBER:			
PROJECT MANAGER: JP Cumming			
SAMPLER: A Plummer — SAMPLER MOBILE: 0400 821 977	RELINQUISHED BY: A Plummer DATE/TIME: 16/3/16	RECEIVED BY: DATE/TIME:	RELINQUISHED BY: DATE/TIME: — RECEIVED BY: [illegible] (ALS) DATE/TIME: 17/3 9-05
COC emailed to ALS? (YES / NO) — EDD FORMAT (or default):			
Email Reports to (will default to PM if no other addresses are listed):			
Email Invoice to: jcumming@geosolutions.net.au			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY | SAMPLE DETAILS MATRIX: Solid(S) Water(W) | CONTAINER INFORMATION | ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required). | Additional Information

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX/PAH	(3 metals)	OC/OP pesticides				Hold Sample	Conserve & Hold Extract	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH08 1.5-1.6m	16-3-16	Soil	JAR	1							✓		
38	↓ 2.0-2.1m	↓			1							✓		
39	↓ 2.5-2.6m				1	✓	✓							
40	BH09 0.3-0.4m				1							✓		
41	BH09 0.4-0.5m				1	✓	✓							
42	BH10 0.4-0.5m				1	✓	✓							
43	BH10 1.0-1.1m				1							✓		
44	BH11 0.4-0.5m				1	✓	✓							
45	↓ 1.8-1.9m				1							✓		
46	2.3-2.4m				1							✓		
47	↓ 2.7-2.8m				1	✓	✓							
48	~~BH9~~ BH12 0.3-0.4	↓			1	✓	✓							
				TOTAL	12	✓	✓							

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CHAIN OF CUSTODY

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☐ Brisbane: 32 Shand St, Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com
★ Melbourne: 2-4 Westall Rd, Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsenviro.com
☐ Perth: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Geoenvironmental Solutions
OFFICE:	86 Queen St, Sandy Bay, TAS 7005
PROJECT:	Collins
ORDER NUMBER:	
PROJECT MANAGER:	JP Cumming
SAMPLER:	A Plummer
SAMPLER MOBILE:	0400 821 977
COC emailed to ALS? (YES / NO)	
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	
Email Invoice to:	jcumming@geosolutions.net.au
TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:	
COC SEQUENCE NUMBER (Circle)	COC: 1 2 3 4 (5) 6 7 / OF: 1 2 3 4 5 6 7
FOR LABORATORY USE ONLY (Circle)	Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt: °C; Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
			Marcu (ALS)
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME: 17/3 9-05

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH, BTEX, PAH	13 metals	OC/OP pesticides				Hold Sample	Conserve & Hold Extract	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
49	BH12 1.0-1.1m	16-3-16	Soil	JAR	1							✓		
50	1.5-1.6m	↓	↓	↓	1	✓	✓							
51	2.0-2.1m				1							✓		
52	↓ 2.9-3.0m				1	✓	✓							
53	BH13 0.3-0.4m				1	✓	✓							
54	0.6-0.7m				1							✓		
55	0.9-1.0m				1							✓		
56	↓ 1.0-1.1m	↓	↓	↓	1	✓	✓							
57	DUP 3	16-3-16	Soil	JAR	1	✓	✓							
58	Duplicate	15-3-16	↓	↓	1	✓	✓							
59	Duplicate 2	15-3-16	↓	↓	1	✓	✓							
				TOTAL	81									

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

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☐ Townsville: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E:townsville@alsenviro.com
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☐ Launceston: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: Geoenvironmental Solutions	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: 86 Queen St, Sandy Bay, TAS 7005			
PROJECT: Collins	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	
ORDER NUMBER:		OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: JP Cumming			
SAMPLER: JScandrett/APlowman	SAMPLER MOB: 0467 545 787	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME:	DATE/TIME:
Email Invoice to: jcumming@geosolutions.net.au		RELINQUISHED BY:	RECEIVED BY: Marcia (ALS)
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		DATE/TIME:	DATE/TIME: 17/3 9:05

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, indicate if Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TPH/BTEX, PAH	13 metals	o/p pesticides				Hold Sample	Conserve & Hold Extract	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
60	7116-01	15-3-16	W	1AG/2VS/1P	4	✓	✓							
61	7116-02				4	✓	✓							
62	7116-04				4	✓	✓							
63	7116-05				4	✓	✓							
64	duplicate ~~SW~~				4	✓	✓							
65	rinsate 1				4	✓								
66	rinsate 2				4	✓								
67	BH10 1-5-1-6m		Soil	jar	1							✓		
68	BH10 2-1-2-2m				1	✓	✓							
69	BH10 3-4-3-5				1	✓	✓							
70	BH10 4-3-4-4				1							✓		
●	7116-03		water	1AG/2VS/1P	4	✓	✓	in separate esta Sydney 17/3/16						
				TOTAL	48									

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Extra Samples:

71	TH06 1.0-1.1m	15/3/16	
72	TH06 1.5-1.6m	15/3/16	

Appendix 3 QA/QC

Duplicate Comparison		EG005T: Total Metals by ICP-AES												EG035T
		Arsenic	Barium	Beryllium	Cadmium	Chromium Total	Cobalt	Copper	Lead	Manganese	Nickel	Vanadium	Zinc	Mercury
4/08/2017	Dup 1	<5	100	<1	<1	9	9	19	76	168	8	32	25	0.2
4/08/2017	BH16 2.5-2.6	<5	80	<1	<1	8	8	24	91	153	8	36	23	0.2
Relative Percentage Difference (RPD) %		NA	22.2	NA	NA	11.8	11.8	23.3	18.0	9.3	0.0	11.8	8.3	0.0
Method Detection Limit (MDL)		NA	200	NA	NA	40	40	100	500	500	40	100	100	2
MDL Class		NONE	LOW	NONE	NONE	LOW	LOW	LOW	MED	MED	LOW	LOW	LOW	LOW
RPD Compliance With MDL?		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		NONE	28	NONE	NONE	38	38	27	12	21	50	38	42	50
4/08/2017	Dup 2	<5	30	<1	<1	8	13	17	52	180	11	19	63	<0.1
4/08/2017	BH18 2.1-2.2	<5	30	<1	<1	9	15	15	45	160	12	17	75	0.1
Relative Percentage Difference (RPD) %		NA	0.0	NA	NA	11.8	14.3	12.5	14.4	11.8	8.7	11.1	17.4	NA
Method Detection Limit (MDL)		NA	200	NA	NA	40	40	100	100	500	40	100	500	NA
MDL Class		NONE	LOW	NONE	NONE	LOW	LOW	LOW	LOW	MED	LOW	LOW	MED	NONE
RPD Compliance With MDL?		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		NONE	50	NONE	NONE	38	36	38	36	18	41	39	33	NONE

Duplicate Comparison		EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																	
		Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Sum of polycyclic aromatic hyds	Benzo(a)pyrene TEQ (WHO)
4/08/2017	Dup 1	0.8	1.3	<0.5	1	7.1	2.3	6.4	6.3	2.8	2.3	2.6	0.9	1.9	0.6	<0.5	0.7	37	2.6
4/08/2017	BH16 2.5-2.6	0.7	1.3	<0.5	0.8	7.3	2	7.1	6.9	3.2	2.5	3.3	1.2	2.6	0.9	<0.5	1.1	40.9	3.5
Relative Percentage Difference (RPD) %		13.3	0.0	NA	22.2	2.8	14.0	10.4	9.1	13.3	8.3	23.7	28.6	31.1	40.0	NA	44.4	10.0	29.5
Method Detection Limit (MDL)		10	10	NA	10	50	10	50	50	10	10	10	10	10	10	NA	10	>50	10
MDL Class		LOW	LOW	NONE	LOW	MED	LOW	MED	MED	LOW	LOW	LOW	LOW	LOW	LOW	NONE	LOW	HIGH	LOW
RPD Compliance With MDL?		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		37	50	NONE	28	47	36	40	41	37	42	26	21	19	10	NONE	6	5	20
4/08/2017	Dup 2	0.9	1.6	<0.5	0.6	7.4	2	6.4	6.5	3.1	2.6	2.7	1.1	2	0.6	<0.5	0.7	38.2	2.8
4/08/2017	BH18 2.1-2.2	0.7	1.7	<0.5	0.6	7.9	2.1	6.8	6.9	3.2	2.7	2.9	1.1	2.3	0.8	<0.5	0.9	40.6	3.1
Relative Percentage Difference (RPD) %		25.0	6.1	NA	0.0	6.5	4.9	6.1	6.0	3.2	3.8	7.1	0.0	14.0	28.6	NA	25.0	6.1	10.2
Method Detection Limit (MDL)		10	10	NA	NA	50	10	50	50	10	10	10	10	10	10	NA	10	>50	10
MDL Class		LOW	LOW	NONE	NONE	MED	LOW	MED	MED	LOW	LOW	LOW	LOW	LOW	LOW	NONE	LOW	HIGH	LOW
RPD Compliance With MDL?		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		25	44	NONE	NONE	23	45	44	44	47	46	43	50	36	21	NONE	25	9	40

Duplicate Comparison		EP080: BTEX					EP080: BTEXN			EP080/071: Total Petroleum Hydrocarb					EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft											EP004: O
		Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Sum of BTEX	Total Xylenes	Naphthalene	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	C6 - C10 Fraction	F1	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	Aliphatic > C35	Aromatic C16-C35	Aromatic > C35	2-Bromonaphthalene	2-Fluorobiphenyl	Total Organic Carbon
4/08/2017	Dup 1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	100	<100	100	<10	<10	<50	130	<100	130	<0.2	<0.5	<0.5	<0.5	<0.5	<1
4/08/2017	BH16 2.5-2.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	120	<100	120	<10	<10	<50	160	<100	160	<0.2	<0.5	<0.5	<0.5	<0.5	<1
Relative Percentage Difference (RPD) %		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18.2	NA	18.2	NA	NA	NA	20.7	NA	20.7	NA	NA	NA	NA	NA	NA
Method Detection Limit (MDL)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1000	NA	NA	NA	2000	NA	1000	NA	NA	NA	NA	NA	NA
MDL Class		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	LOW	NONE	NONE	NONE	LOW	NONE	LOW	NONE	NONE	NONE	NONE	NONE	NONE
RPD Compliance With MDL?		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	32	NONE	NONE	NONE	29	NONE	29	NONE	NONE	NONE	NONE	NONE	NONE
4/08/2017	Dup 2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	1	<10	<50	120	<100	120	<10	<10	<50	140	<100	140	<0.2	<0.5	<0.5	<0.5	<0.5	1
4/08/2017	BH18 2.1-2.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	1	<10	<50	140	<100	140	<10	<10	<50	170	<100	170	<0.2	<0.5	<0.5	<0.5	<0.5	1
Relative Percentage Difference (RPD) %		NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	15.4	NA	15.4	NA	NA	NA	19.4	NA	19.4	NA	NA	NA	NA	NA	0.0
Method Detection Limit (MDL)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2000	NA	1000	NA	NA	NA	2000	NA	1000	NA	NA	NA	NA	NA	NA
MDL Class		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	LOW	NONE	LOW	NONE	NONE	NONE	LOW	NONE	LOW	NONE	NONE	NONE	NONE	NONE	NONE
RPD Compliance With MDL?		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	35	NONE	35	NONE	NONE	NONE	31	NONE	31	NONE	NONE	NONE	NONE	NONE	NONE

Quality Control Blanks		EP080								EP080/071					EP080/071										
		0	EP080: BTEXN	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	0	EP080/071: Total Petroleum Hydrocarbons	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	0	EP080/071: Total Recoverable Hydrocarbons -	C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	>C10 - C16 Fraction minus Naphthalene (F2)
Unit		0	0	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	0	0	µg/L	µg/L	µg/L	µg/L	µg/L	0	0	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		0	0	1	2	2	2	2	2	0	0	20	50	100	50	50	0	0	20	20	100	100	100	100	100
Date	Sample																								
7/08/2017	Rinsate 2	<1	<2	<2	<2	<2	<2	<1	<5			<20	<50	<100	<50	<50			<20	<20	<100	<100	<100	<100	<100
4/08/2017	Trip blank	<1	<2	<2	<2	<2	<2	<1	<5			<20							<20	<20					
4/08/2017	Rinsate 1	<1	<2	<2	<2	<2	<2	<1	<5			<20	<50	<100	<50	<50			<20	<20	<100	<100	<100	<100	<100

Duplicate Comparrison		EA055	ED040	EG005													EG035	EP080					EP080						EP080					
		Moisture Content (dried @ 103°	Sulfate as SO4 2-	Arsenic	Barium	Beryllium	Cadmium	Chromium Total	Cobalt	Copper	Lead	Manganese	Nickel	Vanadium	Zinc	Mercury	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Sum of BTEX	Total Xylenes	Naphthalene	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	C6 - C10 Fraction	F1	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)
16/03/2016	DUP 3	7.9		5	10	<1	<1	11	8	7	7	358	11	21	46	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50
15/03/2016	TH06 0.5-0.6m	14.3		<5	140	<1	<1	27	23	65	<5	373	29	106	22	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50
Relative Percentage Difference (RPD) %		57.7		NA	173.3	NA	NA	84.2	96.8	161.1	NA	4.1	90.0	133.9	70.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit (MDL)		20		NA	200	NA	NA	40	40	100	NA	>500	40	500	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MDL Class		LOW		NONE	LOW	NONE	NONE	LOW	LOW	LOW	NONE	HIGH	LOW	MED	LOW	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
RPD Compliance With MDL?		NO		YES	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		-8		NONE	-123	NONE	NONE	-34	-47	-111	NONE	11	-40	-104	-21	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
15/03/2016	Duplicate 2	20		<5	30	<1	<1	8	5	8	6	150	6	25	16	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50
15/03/2016	TH05 4.5-4.6m	21		<5	80	<1	<1	16	17	18	6	159	12	94	14	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50
Relative Percentage Difference (RPD) %		4.9		NA	90.9	NA	NA	66.7	109.1	76.9	0.0	5.8	66.7	116.0	13.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit (MDL)		100		NA	200	NA	NA	40	40	100	NA	500	40	500	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MDL Class		MED		NONE	LOW	NONE	NONE	LOW	LOW	LOW	NONE	MED	LOW	MED	LOW	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
RPD Compliance With MDL?		YES		YES	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		25		NONE	-41	NONE	NONE	-17	-59	-27	NONE	24	-17	-66	37	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
15/03/2016	Duplicate	23.9		8	10	<1	<1	8	4	7	8	58	6	21	17	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50
16/03/2016	BH09 0.4-0.5m	18.2		<5	30	<1	<1	21	9	18	7	57	10	72	13	<0.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<1	<10	<50	<100	<100	<50	<10	<10	<50	<100	<100	<50
Relative Percentage Difference (RPD) %		27.1		NA	100.0	NA	NA	89.7	76.9	88.0	13.3	1.7	50.0	109.7	26.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit (MDL)		100		NA	200	NA	NA	40	40	100	100	100	40	100	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MDL Class		MED		NONE	LOW	NONE	NONE	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
RPD Compliance With MDL?		YES		YES	NO	YES	YES	NO	NO	NO	YES	YES	FALSE	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Deviation from MDL (%)		3		NONE	-50	NONE	NONE	-40	-27	-38	37	48	0	-60	23	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Quality Control Blanks		EG020T	EP080								EP080/071					EP080/071					
		Lead	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Sum of BTEX	Naphthalene	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction	C10 - C36 Fraction (sum)	C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)
Unit		mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		0.001	1	2	2	2	2	2	1	5	20	50	100	50	50	20	20	100	100	100	100
Date	Sample	----																			
15/03/2016	rinsate 1	----	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100
15/03/2016	rinsate 2	----	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	<20	<20	<100	<100	<100	<100

Summary of Groundwater Duplicate RPD's & Mean Detection Limits (units in µg/l)

Date Collected	Water Sample	Benzene	Toluene	Ethyl-benzene	Xylene			BTEX	Napth-alene	TPH Carbon Chain Fractions					Metal
					M, P	O	Total	Total		6 - 9	10 - 14	15 - 28	29 - 36	10 - 36	Pb
Field Blanks															
Rinse Blanks															
15/03/2016	rinsate 1	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	----
Groundwater Splits - Fixed RPD Method															
15/03/2016	duplicate	<20	<20	<100	<100	<100	<100	<100		<20	<50	<100	<50	<50	<0.001
15/03/2016	7116-04	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	<0.001
RPD		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Date Collected	Water Sample	Benzene	Toluene	Ethyl-benzene	Xylene			BTEX	Napth-alene	TPH Carbon Chain Fractions					Metal
					M, P	O	Total	Total		6 - 9	10 - 14	15 - 28	29 - 36	10 - 36	Pb
Groundwater Splits - MDL Method															
Mean Detection Limit		<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	0.001
Duplicate															
Level Calculation		#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	NONE	NONE	NONE	NONE	NONE	NONE
Compliance?		#VALUE!	#VALUE!	#VALUE!	#VALUE!	########	#VALUE!	#VALUE!	#VALUE!	YES	YES	YES	YES	YES	YES

Date Collected	Water Sample	Benzene	Toluene	Ethyl-benzene	Xylene			BTEX	Napth-alene	TPH Carbon Chain Fractions					Metal
					M, P	O	Total	Total		6 - 9	10 - 14	15 - 28	29 - 36	10 - 36	Pb
Field Blanks															
4/08/2017	Trip blank	<1	<2	<2	<2	<2	<2	<1	<5	<20	----	----	----	----	----
Rinse Blanks															
7/08/2017	Rinsate 2	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	----
Groundwater Splits - Fixed RPD Method															
7/08/2017	DUP	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	<0.001
7/08/2017	7116-5	<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	<0.001
RPD		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Date Collected	Water Sample	Benzene	Toluene	Ethyl-benzene	Xylene			BTEX	Napth-alene	TPH Carbon Chain Fractions					Metal
					M, P	O	Total	Total		6 - 9	10 - 14	15 - 28	29 - 36	10 - 36	Pb
Groundwater Splits - MDL Method															
Mean Detection Limit		<1	<2	<2	<2	<2	<2	<1	<5	<20	<50	<100	<50	<50	0.001
Duplicate															
Level Calculation		NONE	NONE	NONE	NONE	NONE	NONE		NONE	NONE	NONE	NONE	NONE	NONE	NONE
Compliance?		YES	YES	YES	YES	YES	YES	FALSE	YES	YES	YES	YES	YES	YES	YES

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: EM1710504	Page	: 1 of 12
Client	: GEO-ENVIRONMENTAL SOLUTIONS	Laboratory	: Environmental Division Melbourne
Contact	: S JOYCE	Contact	: Shirley LeCornu
Address	: 86 QUEEN STREET SANDY BAY TASMANIA, AUSTRALIA 7005	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6223 1839	Telephone	: +61-3-8549 9630
Project	: 2 Collins Street	Date Samples Received	: 08-Aug-2017
Order number	: ----	Date Analysis Commenced	: 08-Aug-2017
C-O-C number	: ----	Issue Date	: 11-Aug-2017
Sampler	: AARON PLUMMER		
Site	: ----		
Quote number	: Blanket quote 2017		
No. of samples received	: 35		
No. of samples analysed	: 27		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC

Page : 2 of 12
Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1043089)									
EM1710504-009	BH14 0.5-0.6	EA055: Moisture Content	---	1	%	9.5	7.7	21.1	No Limit
EM1710504-024	BH19 0.5-0.6	EA055: Moisture Content	---	1	%	17.3	17.1	0.872	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1041002)									
EM1710504-020	BH17 2.5-2.6	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	60	70	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	9	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	8	8	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	9	22.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	38	60	45.6	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	46	46	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	237	257	7.93	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	35	44	23.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	23	23	0.00	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EM1710404-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	2	2	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	230	230	0.00	0% - 20%
		EG005T: Chromium	7440-47-3	2	mg/kg	75	74	1.42	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	21	21	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	79	77	2.89	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	66	78	17.0	0% - 50%

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Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1041002) - continued									
EM1710404-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	3950	4020	1.77	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	154	140	9.55	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	82	80	2.40	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	182	169	7.14	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1041004)									
EM1710504-035	Dup 2	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	40	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	8	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	13	14	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	11	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	17	16	9.16	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	52	68	25.4	0% - 50%
		EG005T: Manganese	7439-96-5	5	mg/kg	180	195	8.21	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	19	21	12.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	63	69	8.73	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1041001)									
EM1710404-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	25.3	# 56.1	78.6	0% - 20%
EM1710504-020	BH17 2.5-2.6	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.6	0.7	17.4	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1041005)									
EM1710504-035	Dup 2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1041069)									
EM1710504-024	BH19 0.5-0.6	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.6	<0.5	23.8	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	2.5	2.4	5.50	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	0.6	0.5	18.1	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	9.1	7.6	17.6	0% - 50%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	3.0	2.9	3.84	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	17.2	19.9	14.7	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	18.7	21.4	13.5	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	10.4	12.3	16.0	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	8.3	9.5	14.0	0% - 50%
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	13.2	14.6	9.51	0% - 20%
			205-82-3						

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Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1041069) - continued									
EM1710504-024	BH19 0.5-0.6	EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	3.8	5.4	35.9	0% - 50%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	10.9	12.9	17.0	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	3.9	4.4	13.4	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.2	1.3	13.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.6	5.2	12.4	0% - 50%
EM1710504-009	BH14 0.5-0.6	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	1.3	1.3	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	6.6	5.8	12.0	0% - 50%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.4	1.1	21.6	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	23.0	# 18.1	23.8	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	7.6	6.5	15.7	0% - 50%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	39.0	32.7	17.7	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	43.3	37.3	15.0	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	25.6	23.0	10.5	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	22.5	20.5	9.32	0% - 20%
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	30.5	28.7	6.21	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	11.4	9.4	19.1	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	27.2	24.2	11.3	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	10.1	8.9	12.6	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	3.0	2.7	9.87	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	13.5	11.4	16.2	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1040925)									
EM1710504-009	BH14 0.5-0.6	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.00	No Limit
EM1710504-024	BH19 0.5-0.6	EP080: C6 - C9 Fraction	---	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1041070)									
EM1710504-024	BH19 0.5-0.6	EP071: C15 - C28 Fraction	---	100	mg/kg	620	420	36.7	No Limit
		EP071: C29 - C36 Fraction	---	100	mg/kg	330	250	25.9	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	---	50	mg/kg	950	670	34.6	0% - 50%
EM1710504-009	BH14 0.5-0.6	EP071: C15 - C28 Fraction	---	100	mg/kg	1110	1030	7.54	0% - 50%
		EP071: C29 - C36 Fraction	---	100	mg/kg	720	680	5.89	No Limit
		EP071: C10 - C14 Fraction	---	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	---	50	mg/kg	1830	1710	6.78	0% - 20%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1040925)									
EM1710504-009	BH14 0.5-0.6	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1710504-024	BH19 0.5-0.6	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1041070)									
EM1710504-024	BH19 0.5-0.6	EP071: >C16 - C34 Fraction	---	100	mg/kg	830	600	32.6	No Limit
		EP071: >C34 - C40 Fraction	---	100	mg/kg	140	100	30.6	No Limit

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Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1041070) - continued									
EM1710504-024	BH19 0.5-0.6	EP071: >C10 - C16 Fraction	—	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	—	50	mg/kg	970	700	32.3	0% - 50%
EM1710504-009	BH14 0.5-0.6	EP071: >C16 - C34 Fraction	—	100	mg/kg	1600	1490	7.03	0% - 50%
		EP071: >C34 - C40 Fraction	—	100	mg/kg	350	330	4.13	No Limit
		EP071: >C10 - C16 Fraction	—	50	mg/kg	70	60	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	—	50	mg/kg	2020	1880	7.18	0% - 20%
EP080: BTEXN (QC Lot: 1040925)									
EM1710504-009	BH14 0.5-0.6	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1710504-024	BH19 0.5-0.6	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1042681)									
EM1710454-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.015	0.016	0.00	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.022	0.021	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.010	0.011	12.9	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EM1710504-003	7116-4	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit

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Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report: LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1042681) - continued									
EM1710504-003	7116-4	EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.016	0.016	0.00	0% - 50%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.069	0.070	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.006	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	0.20	0.20	0.00	0% - 50%
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.28	0.28	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1042682)									
EM1710454-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1710504-003	7116-4	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1042482)									
EM1710484-001	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	1220	1010	18.8	0% - 20%
EM1710497-110	Anonymous	EP080: C6 - C9 Fraction	---	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1042482)									
EM1710484-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	1520	1300	15.4	0% - 20%
EM1710497-110	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1042482)									
EM1710484-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	1	1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	279	245	13.1	0% - 20%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	239	209	13.4	0% - 20%
		EP080: ortho-Xylene	95-47-6	2	µg/L	13	11	10.6	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	94	108	13.4	0% - 20%
EM1710497-110	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1041002)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	97.0	79	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	111	85	120
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	114	82	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	92.4	85	109
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	102	83	109
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	101	78	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	102	78	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	102	78	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	97.8	82	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	98.0	82	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	96.3	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	103	80	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	97.3	82	111
EG005T: Total Metals by ICP-AES (QCLot: 1041004)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	86.3	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	90.0	79	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	98.9	85	120
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	97.2	82	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.2	85	109
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	94.0	83	109
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	93.4	78	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	91.0	78	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	86.5	78	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	90.0	82	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	90.2	82	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	99.5	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	93.8	80	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	88.5	82	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1041001)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.4	77	104
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1041005)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	91.7	77	104
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1041069)								

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1041069) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	111	80	121
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	102	70	130
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	109	80	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	108	70	124
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	112	80	122
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	96.2	80	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	108	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	113	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	91.3	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	108	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	94.3	70	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	102	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	79.4	65	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	78.2	65	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	74.2	65	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	87.6	65	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1040925)								
EP080: C6 - C9 Fraction	---	10	mg/kg	<10	36 mg/kg	97.4	70	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1041070)								
EP071: C10 - C14 Fraction	---	50	mg/kg	<50	837 mg/kg	99.0	65	131
EP071: C15 - C28 Fraction	---	100	mg/kg	<100	3061 mg/kg	97.4	70	126
EP071: C29 - C36 Fraction	---	100	mg/kg	<100	1592 mg/kg	94.3	70	122
EP071: C10 - C36 Fraction (sum)	---	50	mg/kg	<50	---	---	---	---
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1040925)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	94.5	68	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1041070)								
EP071: >C10 - C16 Fraction	---	50	mg/kg	<50	1222 mg/kg	98.3	68	130
EP071: >C16 - C34 Fraction	---	100	mg/kg	<100	3919 mg/kg	97.2	72	116
EP071: >C34 - C40 Fraction	---	100	mg/kg	<100	316 mg/kg	94.0	38	132
EP071: >C10 - C40 Fraction (sum)	---	50	mg/kg	<50	---	---	---	---
EP080: BTEXN (QCLot: 1040925)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	98.5	74	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	100	77	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	93.2	73	125
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	96.1	77	128
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	99.4	81	128

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 1040925) - continued								
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	93.5	68	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1042681)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.2	91	107
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	94.0	82	113
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	98.6	84	106
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.7	84	104
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.9	83	103
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	93.4	83	106
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.3	82	103
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.0	83	105
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.0	83	105
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.9	82	106
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.2	82	109
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	95.3	83	106
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.3	85	109
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	103	84	116
EG035F: Dissolved Mercury by FIMS (QCLot: 1042682)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	81.4	81	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1040891)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	91.0	39	110
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	96.0	40	124
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	94.4	47	117
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	97.4	51	118
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	95.0	53	119
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	67.4	51	113
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	100	59	123
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	99.7	58	123
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	97.7	52	126
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	93.9	55	123
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	104	52	131
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	90.6	57	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	101	56	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	104	53	123
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	104	53	125

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS Recovery (%)	Recovery Limits (%): Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1040891) - continued								
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	102	53	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1040892)								
EP071: C10 - C14 Fraction	---	50	µg/L	<50	3368 µg/L	89.6	53	123
EP071: C15 - C28 Fraction	---	100	µg/L	<100	14735 µg/L	88.4	57	133
EP071: C29 - C36 Fraction	---	50	µg/L	<50	7856 µg/L	85.0	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1042482)								
EP080: C6 - C9 Fraction	---	20	µg/L	<20	360 µg/L	82.2	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1040892)								
EP071: >C10 - C16 Fraction	---	100	µg/L	<100	5225 µg/L	87.4	54	122
EP071: >C16 - C34 Fraction	---	100	µg/L	<100	19994 µg/L	84.7	56	132
EP071: >C34 - C40 Fraction	---	100	µg/L	<100	1449 µg/L	93.6	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1042482)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	77.6	65	125
EP080: BTEXN (QCLot: 1042482)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	88.6	76	120
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	89.7	76	124
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	91.8	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	94.6	72	130
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	97.4	78	128
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	128	71	129

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1041002)							
EM1710404-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.6	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	91.4	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	97.5	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	84.9	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	81.1	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	95.5	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	# Not Determined	76	124

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1041002) - continued							
EM1710404-001	Anonymous	EG005T: Manganese	7439-96-5	50 mg/kg	90.7	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	79.0	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	76.6	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	83.3	76	124
		EG005T: Zinc	7440-66-6	50 mg/kg	94.9	74	128
EG005T: Total Metals by ICP-AES (QCLot: 1041004)							
EM1710504-035	Dup 2	EG005T: Arsenic	7440-38-2	50 mg/kg	103	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	104	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	108	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	93.8	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	99.4	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	108	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	97.5	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	98.4	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	94.7	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	92.2	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	102	76	124
		EG005T: Zinc	7440-66-6	50 mg/kg	108	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1041001)							
EM1710404-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	# Not Determined	76	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1041069)							
EM1710504-011	BH14 2.5-2.6	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	106	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	138	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1040925)							
EM1710504-011	BH14 2.5-2.6	EP080: C6 - C9 Fraction	---	28 mg/kg	80.4	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1041070)							
EM1710504-012	BH15 0.5-0.6	EP071: C10 - C14 Fraction	---	837 mg/kg	102	53	123
		EP071: C15 - C28 Fraction	---	3061 mg/kg	99.9	70	124
		EP071: C29 - C36 Fraction	---	1592 mg/kg	97.6	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1040925)							
EM1710504-011	BH14 2.5-2.6	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	76.4	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1041070)							
EM1710504-012	BH15 0.5-0.6	EP071: >C10 - C16 Fraction	---	1222 mg/kg	101	65	123
		EP071: >C16 - C34 Fraction	---	3919 mg/kg	99.8	67	121
		EP071: >C34 - C40 Fraction	---	316 mg/kg	107	44	126

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 1040925)							
EM1710504-011	BH14 2.5-2.6	EP080: Benzene	71-43-2	2 mg/kg	116	50	136
		EP080: Toluene	108-88-3	2 mg/kg	113	56	139

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1042681)							
EM1710454-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	96.5	85	131
		EG020A-F: Beryllium	7440-41-7	0.2 mg/L	94.8	73	141
		EG020A-F: Barium	7440-39-3	0.2 mg/L	94.4	75	127
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	99.5	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	91.9	71	135
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	95.6	78	132
		EG020A-F: Copper	7440-50-8	0.2 mg/L	94.6	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	92.6	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	92.3	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	96.4	73	131
		EG020A-F: Vanadium	7440-62-2	0.2 mg/L	90.7	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	94.4	75	131
EG035F: Dissolved Mercury by FIMS (QCLot: 1042682)							
EM1710454-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	82.0	70	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1042482)							
EM1710484-003	Anonymous	EP080: C6 - C9 Fraction	---	280 µg/L	87.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1042482)							
EM1710484-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	86.6	44	122
EP080: BTEXN (QCLot: 1042482)							
EM1710484-003	Anonymous	EP080: Benzene	71-43-2	20 µg/L	102	68	130
		EP080: Toluene	108-88-3	20 µg/L	101	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM1710504	Page	: 1 of 10
Client	: GEO-ENVIRONMENTAL SOLUTIONS	Laboratory	: Environmental Division Melbourne
Contact	: S JOYCE	Telephone	: +61-3-8549 9630
Project	: 2 Collins Street	Date Samples Received	: 08-Aug-2017
Site	: ----	Issue Date	: 11-Aug-2017
Sampler	: AARON PLUMMER	No. of samples received	: 35
Order number	: ----	No. of samples analysed	: 27

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Page : 2 of 10
Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG035T: Total Recoverable Mercury by FIMS	EM1710404--001	Anonymous	**Mercury**	7439-97-6	78.6 %	0% - 20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1710504--009	BH14 0.5-0.6	**Phenanthrene**	85-01-8	23.8 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1710404--001	Anonymous	**Lead**	7439-92-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Matrix Spikes (MS)					
Total Mercury by FIMS	1	21	4.76	5.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	9	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
BH14 0.5-0.6,	BH14 2.5-2.6,	**04-Aug-2017**	---	---	---	**09-Aug-2017**	18-Aug-2017	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
BH14 0.5-0.6,	BH14 2.5-2.6,	**04-Aug-2017**	**08-Aug-2017**	31-Jan-2018	✓	**09-Aug-2017**	31-Jan-2018	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
BH14 0.5-0.6,	BH14 2.5-2.6,	**04-Aug-2017**	**08-Aug-2017**	01-Sep-2017	✓	**09-Aug-2017**	01-Sep-2017	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								

Appendix 3 QA/QC

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH14 0.5-0.6,	BH14 2.5-2.6,	**04-Aug-2017**	**08-Aug-2017**	18-Aug-2017	✓	**09-Aug-2017**	17-Sep-2017	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
BH14 0.5-0.6,	BH14 2.5-2.6,	**04-Aug-2017**	**08-Aug-2017**	18-Aug-2017	✓	**09-Aug-2017**	18-Aug-2017	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
BH14 0.5-0.6,	BH14 2.5-2.6,	**04-Aug-2017**	**08-Aug-2017**	18-Aug-2017	✓	**09-Aug-2017**	18-Aug-2017	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								

Appendix 3 QA/QC

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Project : 2 Collins Street

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analyzed	Due for analysis	Evaluation
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
BH14 0.5-0.6,	BH14 2.5-2.6,	04-Aug-2017	08-Aug-2017	18-Aug-2017	✓	09-Aug-2017	18-Aug-2017	✓
BH15 0.5-0.6,	BH15 2.5-2.6,							
BH16 0.5-0.6,	BH16 2.5-2.6,							
BH17 0.5-0.6,	BH17 2.5-2.6,							
BH18 0.5-0.6,	BH18 2.1-2.2,							
BH19 0.5-0.6,	BH19 2.5-2.6,							
BH20 0.5-0.6,	BH20 2.5-2.6,							
BH21 0.5-0.6,	BH21 2.1-2.2,							
BH22 0.5,	Dup 1,							
Dup 2								

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analyzed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)								
7116-2,	7116-3,	07-Aug-2017	---	---	---	10-Aug-2017	03-Feb-2018	✓
7116-4,	7116-5,							
DUP								
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)								
7116-2,	7116-3,	07-Aug-2017	---	---	---	09-Aug-2017	04-Sep-2017	✓
7116-4,	7116-5,							
DUP								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP075(SIM))								
7116-2,	7116-3,	07-Aug-2017	08-Aug-2017	14-Aug-2017	✓	09-Aug-2017	17-Sep-2017	✓
7116-4,	7116-5,							
DUP								

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Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analyzed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071)								
Rinsate 1		04-Aug-2017	08-Aug-2017	11-Aug-2017	✓	09-Aug-2017	17-Sep-2017	✓
Amber Glass Bottle - Unpreserved (EP071)								
7116-2,	7116-3,	07-Aug-2017	08-Aug-2017	14-Aug-2017	✓	09-Aug-2017	17-Sep-2017	✓
7116-4,	7116-5,							
DUP,	Rinsate 2							
Amber VOC Vial - Sulfuric Acid (EP080)								
Trip blank,	Rinsate 1	04-Aug-2017	09-Aug-2017	18-Aug-2017	✓	09-Aug-2017	18-Aug-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
7116-2,	7116-3,	07-Aug-2017	09-Aug-2017	21-Aug-2017	✓	09-Aug-2017	21-Aug-2017	✓
7116-4,	7116-5,							
DUP,	Rinsate 2							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071)								
Rinsate 1		04-Aug-2017	08-Aug-2017	11-Aug-2017	✓	09-Aug-2017	17-Sep-2017	✓
Amber Glass Bottle - Unpreserved (EP071)								
7116-2,	7116-3,	07-Aug-2017	08-Aug-2017	14-Aug-2017	✓	09-Aug-2017	17-Sep-2017	✓
7116-4,	7116-5,							
DUP,	Rinsate 2							
Amber VOC Vial - Sulfuric Acid (EP080)								
Trip blank,	Rinsate 1	04-Aug-2017	09-Aug-2017	18-Aug-2017	✓	09-Aug-2017	18-Aug-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
7116-2,	7116-3,	07-Aug-2017	09-Aug-2017	21-Aug-2017	✓	09-Aug-2017	21-Aug-2017	✓
7116-4,	7116-5,							
DUP,	Rinsate 2							
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)								
Trip blank,	Rinsate 1	04-Aug-2017	09-Aug-2017	18-Aug-2017	✓	09-Aug-2017	18-Aug-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080)								
7116-2,	7116-3,	07-Aug-2017	09-Aug-2017	21-Aug-2017	✓	09-Aug-2017	21-Aug-2017	✓
7116-4,	7116-5,							
DUP,	Rinsate 2							

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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	22	13.64	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	22	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	22	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	21	4.76	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	22	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	9	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

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Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1602834**	Page	: 1 of 25
Client	: **GEO-ENVIRONMENTAL SOLUTIONS**	Laboratory	: Environmental Division Melbourne
Contact	: DR JOHN PAUL CUMMING	Contact	: Shirley LeCornu
Address	: 86 QUEEN STREET SANDY BAY TASMANIA, AUSTRALIA 7005	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6223 1839	Telephone	: +61-3-8549 9630
Project	: Collins	Date Samples Received	: 17-Mar-2016
Order number	: ----	Date Analysis Commenced	: 18-Mar-2016
C-O-C number	: ----	Issue Date	: 29-Mar-2016
Sampler	: AARON PLUMMER		
Site	: ----		
Quote number	: ----		
No. of samples received	: 72		
No. of samples analysed	: 40		

NATA Accredited Laboratory 825
Accredited for compliance with ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.
This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 399420)									
EM1602817-045	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	43.5	43.2	0.741	0% - 20%
EM1602828-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	7.1	6.5	9.05	No Limit
EA055: Moisture Content (QC Lot: 399421)									
EM1602834-016	TH05 0.5-0.6m	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	6.0	6.9	12.6	No Limit
EM1602834-041	BH09 0.4-0.5m	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	18.2	19.3	5.71	0% - 50%
EA055: Moisture Content (QC Lot: 399422)									
EM1602834-058	Duplicate	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	23.9	24.1	0.830	0% - 20%
EM1602851-007	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	16.7	15.8	5.70	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 399399)									
EM1602813-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	20	30	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	14	9.43	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	15	9.54	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	35	38	7.67	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	84	92	9.95	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	17	19	10.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	38	41	6.74	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EM1602834-007	TH03 0.5-0.6m	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 399399) - continued									
EM1602834-007	TH03 0.5-0.6m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	20	20	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	2	2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	90	91	1.43	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	5	5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	19	0.00	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 399402)									
EM1602834-031	BH07 0.4-0.5m	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	3	3	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	120	130	0.00	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	11	12	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	13	13	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	56	58	1.95	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	404	412	1.99	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	281	283	0.668	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	39	39	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	305	311	1.96	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EM1602834-050	BH12 1.5-1.6m	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	120	120	0.00	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	24	24	0.00	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	25	25	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	22	23	0.00	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	114	118	2.79	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	46	46	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	502	516	2.62	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	110	114	3.54	0% - 20%

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Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 399402) - continued									
EM1602834-050	BH12 1.5-1.6m	EG005T: Zinc	7440-66-6	5	mg/kg	383	393	2.67	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 399400)									
EM1602813-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1602834-007	TH03 0.5-0.6m	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 399401)									
EM1602834-031	BH07 0.4-0.5m	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.4	0.5	0.00	No Limit
EM1602834-050	BH12 1.5-1.6m	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 401929)									
EM1602774-011	Anonymous	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EM1602857-014	Anonymous	EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 401929) - continued									
EM1602857-014	Anonymous	EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 401929)									
EM1602774-011	Anonymous	EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EM1602857-014	Anonymous	EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 401929) - continued									
EM1602857-014	Anonymous	EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 400574)									
EM1602834-001	TH01 0.4-0.8m	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	1.9	1.5	25.9	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	19.6	17.6	10.8	0% - 50%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	24.9	22.6	9.65	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	61.8	57.8	6.67	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	53.8	54.6	1.52	0% - 20%
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	60.6	62.5	2.96	0% - 20%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	34.5	35.6	3.20	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	22.2	21.1	5.11	0% - 50%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	52.1	51.3	1.53	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	8.1	7.1	13.2	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	109	102	7.13	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	6.2	4.8	25.4	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	26.7	27.1	1.54	0% - 20%
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	11.4	7.8	37.4	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	74.0	66.6	10.5	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	109	102	6.82	0% - 20%
EM1602834-019	TH05 2.0-2.1m	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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Project : Collins

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 400574) - continued									
EM1602834-019	TH05 2.0-2.1m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 400679)									
EM1602834-044	BH11 0.4-0.5m	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.7	0.6	22.6	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.9	0.8	18.2	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	4.3	3.6	16.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	4.4	3.9	13.8	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	5.2	4.4	14.7	0% - 50%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.9	2.4	17.1	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.9	1.4	25.1	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	4.3	3.6	17.9	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	0.6	0.6	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	6.8	5.4	24.0	0% - 50%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.3	2.0	15.8	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.9	2.1	30.9	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	7.6	6.2	21.0	0% - 50%
EM1602847-043	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 401933)									
EM1602857-014	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 401933) - continued									
EM1602857-014	Anonymous	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 401987)									
EM1602834-056	BH13 1.0-1.1m	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	0.6	26.1	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.2	81.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	0.6	18.2	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	1.0	65.7	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	0.7	33.7	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	1.1	74.4	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3.1	144	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2.8	140	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	2.2	127	No Limit
EM1602886-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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Project : Collins

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 401987) - continued									
EM1602886-001	Anonymous	EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 398662)									
EM1602834-001	TH01 0.4-0.8m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1602834-019	TH05 2.0-2.1m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 398665)									
EM1602834-042	BH10 0.4-0.5m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1602834-059	Duplicate 2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 400575)									
EM1602834-001	TH01 0.4-0.8m	EP071: C15 - C28 Fraction	----	100	mg/kg	2630	2460	6.55	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	1510	1380	9.05	0% - 50%
		EP071: C10 - C14 Fraction	----	50	mg/kg	80	80	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	4220	3920	7.37	0% - 20%
EM1602834-019	TH05 2.0-2.1m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 400678)									
EM1602834-044	BH11 0.4-0.5m	EP071: C15 - C28 Fraction	----	100	mg/kg	260	180	38.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	130	<100	28.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	390	180	73.7	No Limit
EM1602847-043	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 401931)									
EM1602857-014	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	----	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	----	<100	0.00	No Limit

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Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 401931) - continued									
EM1602857-014	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	----	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	----	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 401986)									
EM1602834-056	BH13 1.0-1.1m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1602886-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 398662)									
EM1602834-001	TH01 0.4-0.8m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1602834-019	TH05 2.0-2.1m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 398665)									
EM1602834-042	BH10 0.4-0.5m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1602834-059	Duplicate 2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 400575)									
EM1602834-001	TH01 0.4-0.8m	EP071: >C16 - C34 Fraction	----	100	mg/kg	3720	3440	7.73	0% - 20%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	690	670	2.09	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	210	200	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	4620	4310	6.94	0% - 20%
EM1602834-019	TH05 2.0-2.1m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 400678)									
EM1602834-044	BH11 0.4-0.5m	EP071: >C16 - C34 Fraction	----	100	mg/kg	360	250	36.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	360	250	36.1	No Limit
EM1602847-043	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 401931)									
EM1602857-014	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	----	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	----	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	----	<50	0.00	No Limit

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Project : Collins

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 401931) - continued									
EM1602857-014	Anonymous	EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 401986)									
EM1602834-056	BH13 1.0-1.1m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1602886-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 398662)									
EM1602834-001	TH01 0.4-0.8m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	8	5	43.8	No Limit
EM1602834-019	TH05 2.0-2.1m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 398665)									
EM1602834-042	BH10 0.4-0.5m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	1	1	0.00	No Limit
EM1602834-059	Duplicate 2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 399135)									
EM1602834-061	7116-02	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.085	0.103	18.9	0% - 20%
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.391	0.450	14.1	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.005	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	2.20	2.61	17.0	0% - 20%
EM1602818-013	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 399136)									
EM1602848-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EM1602818-013	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 399457)									
EM1602818-013	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	0.00	No Limit

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 399457) - continued									
EM1602818-013	Anonymous	EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	<1.0	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 399456)									
EM1602870-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	190	110	50.6	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	300	270	10.5	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EM1602818-013	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 401808)									
EM1602831-010	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1602847-065	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 399456)									
EM1602870-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	310	270	13.6	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	130	<100	28.1	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EM1602818-013	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 401808)									
EM1602831-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1602847-065	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 401808)									
EM1602831-010	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1602847-065	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit

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Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 401808) - continued									
EM1602847-065	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 399399)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	101	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	99.0	92	116
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	101	77	125
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	109	84	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	98.4	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.6	89	113
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	96.6	81	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.0	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	93.3	85	107
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	98.6	87	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	103	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	96.9	81	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	105	89	111
EG005T: Total Metals by ICP-AES (QCLot: 399402)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	102	79	113
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	97.9	92	116
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	99.8	77	125
EG005T: Boron	7440-42-8	50	mg/kg	<50	33.2 mg/kg	108	84	124
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.5	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.7	89	113
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	96.1	81	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.1	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	93.2	85	107
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	97.8	87	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	103	89	111
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	103	93	109
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	29.6 mg/kg	95.8	81	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	105	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 399400)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	91.2	85	103
EG035T: Total Recoverable Mercury by FIMS (QCLot: 399401)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.3	85	103
EP068A: Organochlorine Pesticides (OC) (QCLot: 401929)								

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Project : Collins

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP068A: Organochlorine Pesticides (OC) (QCLot: 401929) - continued								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	50	134
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	51	131
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	97.4	38	140
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	52	128
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	100	45	133
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	111	57	135
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	110	46	134
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	52	132
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	101	51	131
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	52	128
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	99.8	51	131
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.7	50	132
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	41	141
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	38	130
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	103	52	132
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.1	49	133
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	48	128
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	52	130
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	100	43	133
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	93.0	41	141
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	103	51	131
EP068B: Organophosphorus Pesticides (OP) (QCLot: 401929)								
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	31.4	14	162
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	53	131
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	117	51	133
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	50	134
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	54	135
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	102	53	131
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	108	41	141
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	104	53	131
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	34	134
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	43	139
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	100	51	133
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	69.2	46	138
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	104	51	131
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	51	133
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	55.4	10	184
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	98.1	51	135
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	100	49	133

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 401929) - continued								
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	100.0	51	133
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 400574)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	94.3	80	120
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	90.3	70	130
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	104	80	126
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	102	70	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	102	65	125
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	97.6	70	124
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	107	65	127
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	108	75	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	110	80	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	108	65	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	99.5	70	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	92.3	70	124
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	103	65	128
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	90.8	80	121
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	97.0	80	122
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	102	80	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 400679)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	105	80	120
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	87.2	70	130
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	103	80	126
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	103	70	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	101	65	125
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	93.1	70	124
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	99.9	65	127
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	102	75	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	111	80	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	101	65	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	106	70	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	103	70	124
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	100.0	65	128
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	108	80	121
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	109	80	122
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	109	80	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 401933)								

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 401933) - continued								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	90.8	80	120
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	99.2	70	130
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	105	80	126
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	96.0	70	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	93.6	65	125
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	95.5	70	124
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	90.9	65	127
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	98.0	75	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	96.2	80	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	90.5	65	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	98.5	70	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	93.9	70	124
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	91.1	65	128
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	92.1	80	121
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	97.3	80	122
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	98.3	80	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 401987)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	94.6	80	120
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	118	70	130
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	122	80	126
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	99.7	70	130
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	88.8	65	125
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	85.7	70	124
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	91.8	65	127
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	106	75	125
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	106	80	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	93.8	65	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	119	70	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	120	70	124
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	93.6	65	128
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	114	80	121
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	107	80	122
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	117	80	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 398662)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	86.8	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 398665)								

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 398665) - continued								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	84.8	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 400575)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	696 mg/kg	107	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3357 mg/kg	89.4	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1564 mg/kg	93.1	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 400678)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	696 mg/kg	95.0	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3357 mg/kg	78.0	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1564 mg/kg	77.7	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 401931)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	696 mg/kg	102	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3357 mg/kg	85.2	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1564 mg/kg	87.0	70	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 401986)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	696 mg/kg	107	65	131
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3357 mg/kg	90.8	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1564 mg/kg	90.3	70	122
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 398662)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	79.3	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 398665)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	81.5	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 400575)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1116 mg/kg	101	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4398 mg/kg	88.6	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	169 mg/kg	112	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 400678)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1116 mg/kg	84.7	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4398 mg/kg	76.4	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	169 mg/kg	93.4	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401931)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1116 mg/kg	98.1	68	130

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401931) - continued								
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4398 mg/kg	84.0	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	169 mg/kg	91.1	38	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401986)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1116 mg/kg	96.0	68	130
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4398 mg/kg	89.6	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	169 mg/kg	95.2	38	132
EP080: BTEXN (QCLot: 398662)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	94.9	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	85.3	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	80.6	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	88.3	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	83.7	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	98.0	75	129
EP080: BTEXN (QCLot: 398665)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	104	74	124
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	90.0	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	93.6	72	132
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	92.0	66	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	96.8	76	130
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	92.9	75	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG020F: Dissolved Metals by ICP-MS (QCLot: 399135)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.9	94	108
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	96.9	87	107
EG020A-F: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	96.4	85	113
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.1 mg/L	95.2	84	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.8	86	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.2	86	110
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	98.5	88	108
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.8	87	107
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.0	87	109
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.8	87	109

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EG020F: Dissolved Metals by ICP-MS (QCLot: 399135) - continued								
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.5	87	109
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.4	87	109
EG020A-F: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	94.2	85	111
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.4	87	107
EG035F: Dissolved Mercury by FIMS (QCLot: 399136)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	91.8	83	117
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 399457)								
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	77.2	46	120
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	86.8	40	124
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	74.3	53	127
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	81.9	52	136
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	86.3	55	133
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	84.4	48	142
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	85.1	52	142
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	80.8	54	134
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	87.3	54	132
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	84.1	52	142
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	87.0	56	130
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	78.2	47	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	84.0	49	143
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	73.3	39	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	81.3	55	125
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	86.3	56	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 399456)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	3584 µg/L	65.0	53	123
EP071: C15 - C28 Fraction	----	100	µg/L	<100	17160 µg/L	81.5	57	133
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8083 µg/L	80.8	55	141
EP080/071: Total Petroleum Hydrocarbons (QCLot: 401808)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	98.3	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 399456)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	5720 µg/L	68.7	54	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22554 µg/L	80.9	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	871 µg/L	75.5	51	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401808)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	96.9	65	125
EP080: BTEXN (QCLot: 401808)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	101	76	120

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 401808) - continued								
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	102	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	105	72	130
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	88.4	71	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	107	75	127
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	101	76	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 399399)							
EM1602813-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	124	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	119	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	108	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	112	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	112	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	112	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	116	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	94.3	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	107	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	106	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	99.0	76	124
		EG005T: Zinc	7440-66-6	50 mg/kg	94.0	74	128
EG005T: Total Metals by ICP-AES (QCLot: 399402)							
EM1602834-033	BH07 3.3-3.4m	EG005T: Arsenic	7440-38-2	50 mg/kg	107	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	118	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	104	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	102	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	102	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	98.0	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	103	68	136
		EG005T: Nickel	7440-02-0	50 mg/kg	97.5	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	95.0	71	125
		EG005T: Vanadium	7440-62-2	50 mg/kg	110	76	124

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 399402) - continued							
EM1602834-033	BH07 3.3-3.4m	EG005T: Zinc	7440-66-6	50 mg/kg	107	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 399400)							
EM1602813-002	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	100	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 399401)							
EM1602834-033	BH07 3.3-3.4m	EG035T: Mercury	7439-97-6	5 mg/kg	97.5	76	116
EP068A: Organochlorine Pesticides (OC) (QCLot: 401929)							
EM1602774-013	Anonymous	EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	91.5	20	133
		EP068: Aldrin	309-00-2	0.5 mg/kg	84.9	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	85.2	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	87.3	23	146
		EP068: gamma-BHC	58-89-9	0.5 mg/kg	104	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	80.0	18	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 401929)							
EM1602774-013	Anonymous	EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	82.1	45	133
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	77.2	41	127
		EP068: Diazinon	333-41-5	0.5 mg/kg	89.0	49	135
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	98.4	47	133
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	63.2	40	128
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 400574)							
EM1602834-005	TH01 4.2-4.5m	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	77.5	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	# Not Determined	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 400679)							
EM1602834-048	BH12 0.3-0.4m	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	95.6	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	65.9	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 401933)							
EM1602834-035	BH08 0.5-0.6m	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	84.7	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	88.6	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 401987)							
EM1602834-058	Duplicate	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	87.6	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	116	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 398662)							
EM1602834-003	TH01 2.5-2.6m	EP080: C6 - C9 Fraction	----	28 mg/kg	79.8	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 398665)							
EM1602834-044	BH11 0.4-0.5m	EP080: C6 - C9 Fraction	----	28 mg/kg	64.1	42	131

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 400575)							
EM1602834-003	TH01 2.5-2.6m	EP071: C10 - C14 Fraction	----	696 mg/kg	118	53	123
		EP071: C15 - C28 Fraction	----	3357 mg/kg	98.6	70	124
		EP071: C29 - C36 Fraction	----	1564 mg/kg	101	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 400678)							
EM1602834-047	BH11 2.7-2.8m	EP071: C10 - C14 Fraction	----	696 mg/kg	85.8	53	123
		EP071: C15 - C28 Fraction	----	3357 mg/kg	70.1	70	124
		EP071: C29 - C36 Fraction	----	1564 mg/kg	67.9	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 401931)							
EM1602774-017	Anonymous	EP071: C10 - C14 Fraction	----	696 mg/kg	99.5	53	123
		EP071: C15 - C28 Fraction	----	3357 mg/kg	82.9	70	124
		EP071: C29 - C36 Fraction	----	1564 mg/kg	85.0	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 401986)							
EM1602834-057	DUP 3	EP071: C10 - C14 Fraction	----	696 mg/kg	98.4	53	123
		EP071: C15 - C28 Fraction	----	3357 mg/kg	83.1	70	124
		EP071: C29 - C36 Fraction	----	1564 mg/kg	82.7	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 398662)							
EM1602834-003	TH01 2.5-2.6m	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	72.0	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 398665)							
EM1602834-044	BH11 0.4-0.5m	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	61.3	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 400575)							
EM1602834-003	TH01 2.5-2.6m	EP071: >C10 - C16 Fraction	----	1116 mg/kg	112	65	123
		EP071: >C16 - C34 Fraction	----	4398 mg/kg	97.5	67	121
		EP071: >C34 - C40 Fraction	----	169 mg/kg	106	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 400678)							
EM1602834-047	BH11 2.7-2.8m	EP071: >C10 - C16 Fraction	----	1116 mg/kg	76.2	65	123
		EP071: >C16 - C34 Fraction	----	4398 mg/kg	67.4	67	121
		EP071: >C34 - C40 Fraction	----	169 mg/kg	75.5	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401931)							
EM1602774-017	Anonymous	EP071: >C10 - C16 Fraction	----	1116 mg/kg	95.6	65	123
		EP071: >C16 - C34 Fraction	----	4398 mg/kg	81.8	67	121
		EP071: >C34 - C40 Fraction	----	169 mg/kg	93.2	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401986)							
EM1602834-057	DUP 3	EP071: >C10 - C16 Fraction	----	1116 mg/kg	87.9	65	123
		EP071: >C16 - C34 Fraction	----	4398 mg/kg	82.0	67	121
		EP071: >C34 - C40 Fraction	----	169 mg/kg	91.4	44	126
EP080: BTEXN (QCLot: 398662)							

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 398662) - continued							
EM1602834-003	TH01 2.5-2.6m	EP080: Benzene	71-43-2	2 mg/kg	96.0	50	136
		EP080: Toluene	108-88-3	2 mg/kg	99.4	56	139
EP080: BTEXN (QCLot: 398665)							
EM1602834-044	BH11 0.4-0.5m	EP080: Benzene	71-43-2	2 mg/kg	98.2	50	136
		EP080: Toluene	108-88-3	2 mg/kg	87.8	56	139

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 399135)							
EM1602793-062	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	96.9	85	131
		EG020A-F: Barium	7440-39-3	0.2 mg/L	96.4	75	127
		EG020A-F: Beryllium	7440-41-7	0.2 mg/L	97.8	73	141
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	105	81	133
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	98.7	71	135
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	98.5	78	132
		EG020A-F: Copper	7440-50-8	0.2 mg/L	103	76	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	97.8	75	133
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	96.2	64	134
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	97.6	73	131
		EG020A-F: Vanadium	7440-62-2	0.2 mg/L	96.7	73	131
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	102	75	131
EG035F: Dissolved Mercury by FIMS (QCLot: 399136)							
EM1602818-013	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	96.0	70	120
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 399457)							
EM1602903-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	5 µg/L	97.8	42	122
		EP075(SIM): Pyrene	129-00-0	5 µg/L	99.3	40	136
EP080/071: Total Petroleum Hydrocarbons (QCLot: 401808)							
EM1602831-011	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	77.5	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 401808)							
EM1602831-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	77.7	44	122
EP080: BTEXN (QCLot: 401808)							
EM1602831-011	Anonymous	EP080: Benzene	71-43-2	20 µg/L	88.3	68	130
		EP080: Toluene	108-88-3	20 µg/L	90.8	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1602834**	Page	: 1 of 11
Client	: **GEO-ENVIRONMENTAL SOLUTIONS**	Laboratory	: Environmental Division Melbourne
Contact	: DR JOHN PAUL CUMMING	Telephone	: +61-3-8549 9630
Project	: Collins	Date Samples Received	: 17-Mar-2016
Site	: ----	Issue Date	: 29-Mar-2016
Sampler	: AARON PLUMMER	No. of samples received	: 72
Order number	: ----	No. of samples analysed	: 40

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1602834--005	TH01 4.2-4.5m	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	EM1602834-044	BH11 0.4-0.5m	**2-Chlorophenol-D4**	93951-73-6	27.7 %	65-123 %	**Recovery less than lower data quality objective**
EP075(SIM)S: Phenolic Compound Surrogates	EM1602834-044	BH11 0.4-0.5m	**2.4.6-Tribromophenol**	118-79-6	10.8 %	34-122 %	**Recovery less than lower data quality objective**
EP075(SIM)T: PAH Surrogates	EM1602834-069	BH10 3.4-3.5m	**2-Fluorobiphenyl**	321-60-8	128 %	61-125 %	**Recovery greater than upper data quality objective**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
TRH - Semivolatile Fraction	7	72	9.72	10.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
TRH - Semivolatile Fraction	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
TH01 0.4-0.8m,	TH01 2.5-2.6m,	**15-Mar-2016**	**----**	----	----	**18-Mar-2016**	29-Mar-2016	✓
TH01 4.2-4.5m,	TH02 0.4-0.8m,							
TH03 0.5-0.6m,	TH03 1.5-1.6m,							
TH03 3.2-3.4m,	TH04 0.5-0.6m,							
TH04 3.5-3.6m,	TH05 0.5-0.6m,							
TH05 2.0-2.1m,	TH05 4.5-4.6m,							
TH06 0.5-0.6m,	TH06 2.0-2.1m,							
TH06 4.5-4.6m,	Duplicate,							
BH07 0.4-0.5m,								
BH07 3.3-3.4m,	Duplicate 2, BH10 2.1-2.2m,							
BH10 3.4-3.5m								
Soil Glass Jar - Unpreserved (EA055-103)								
BH08 0.5-0.6m,	BH08 2.5-2.6m,	**16-Mar-2016**	**----**	----	----	**18-Mar-2016**	30-Mar-2016	✓
BH09 0.4-0.5m,	BH10 0.4-0.5m,							
BH11 0.4-0.5m,	BH11 2.7-2.8m,							
BH12 0.3-0.4m,	BH12 1.5-1.6m,							
BH12 2.9-3.0m,	BH13 0.3-0.4m,							
BH13 1.0-1.1m,	DUP 3							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
TH01 0.4-0.8m,	TH01 2.5-2.6m,	**15-Mar-2016**	**20-Mar-2016**	11-Sep-2016	✓	**22-Mar-2016**	11-Sep-2016	✓
TH01 4.2-4.5m,	TH02 0.4-0.8m,							
TH03 0.5-0.6m,	TH03 1.5-1.6m,							
TH03 3.2-3.4m,	TH04 0.5-0.6m,							
TH04 3.5-3.6m,	TH05 0.5-0.6m,							
TH05 2.0-2.1m,	TH05 4.5-4.6m,							
TH06 0.5-0.6m,	TH06 2.0-2.1m,							
TH06 4.5-4.6m,	Duplicate,							
BH07 0.4-0.5m,								
BH07 3.3-3.4m,	Duplicate 2, BH10 2.1-2.2m,							
BH10 3.4-3.5m								
Soil Glass Jar - Unpreserved (EG005T)								
BH08 0.5-0.6m,	BH08 2.5-2.6m,	**16-Mar-2016**	**20-Mar-2016**	12-Sep-2016	✓	**22-Mar-2016**	12-Sep-2016	✓
BH09 0.4-0.5m,	BH10 0.4-0.5m,							
BH11 0.4-0.5m,	BH11 2.7-2.8m,							
BH12 0.3-0.4m,	BH12 1.5-1.6m,							
BH12 2.9-3.0m,	BH13 0.3-0.4m,							
BH13 1.0-1.1m,	DUP 3							

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
TH01 0.4-0.8m,	TH01 2.5-2.6m,	**15-Mar-2016**	**20-Mar-2016**	12-Apr-2016	✓	**23-Mar-2016**	12-Apr-2016	✓
TH01 4.2-4.5m,	TH02 0.4-0.8m,							
TH03 0.5-0.6m,	TH03 1.5-1.6m,							
TH03 3.2-3.4m,	TH04 0.5-0.6m,							
TH04 3.5-3.6m,	TH05 0.5-0.6m,							
TH05 2.0-2.1m,	TH05 4.5-4.6m,							
TH06 0.5-0.6m,	TH06 2.0-2.1m,							
TH06 4.5-4.6m,	Duplicate,							
BH07 0.4-0.5m,								
BH07 3.3-3.4m,	Duplicate 2, BH10 2.1-2.2m,							
BH10 3.4-3.5m								
Soil Glass Jar - Unpreserved (EG035T)								
BH08 0.5-0.6m,	BH08 2.5-2.6m,	**16-Mar-2016**	**20-Mar-2016**	13-Apr-2016	✓	**23-Mar-2016**	13-Apr-2016	✓
BH09 0.4-0.5m,	BH10 0.4-0.5m,							
BH11 0.4-0.5m,	BH11 2.7-2.8m,							
BH12 0.3-0.4m,	BH12 1.5-1.6m,							
BH12 2.9-3.0m,	BH13 0.3-0.4m,							
BH13 1.0-1.1m,	DUP 3							
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
BH08 0.5-0.6m		**16-Mar-2016**	**22-Mar-2016**	30-Mar-2016	✓	**23-Mar-2016**	01-May-2016	✓

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Project : Collins

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
TH01 0.4-0.8m,	TH01 2.5-2.6m,	**15-Mar-2016**	**21-Mar-2016**	29-Mar-2016	✓	**22-Mar-2016**	30-Apr-2016	✓
TH01 4.2-4.5m,	TH02 0.4-0.8m,							
TH03 0.5-0.6m,	TH03 1.5-1.6m,							
TH03 3.2-3.4m,	TH04 0.5-0.6m,							
TH04 3.5-3.6m,	TH05 0.5-0.6m,							
TH05 2.0-2.1m,	TH05 4.5-4.6m,							
TH06 0.5-0.6m,	TH06 2.0-2.1m,							
TH06 4.5-4.6m,	BH07 0.4-0.5m,							
BH07 3.3-3.4m								
Soil Glass Jar - Unpreserved (EP071)								
Duplicate,	Duplicate 2,	**15-Mar-2016**	**22-Mar-2016**	29-Mar-2016	✓	**22-Mar-2016**	01-May-2016	✓
BH10 2.1-2.2m,	BH10 3.4-3.5m							
Soil Glass Jar - Unpreserved (EP071)								
BH08 2.5-2.6m,	BH09 0.4-0.5m,	**16-Mar-2016**	**21-Mar-2016**	30-Mar-2016	✓	**22-Mar-2016**	30-Apr-2016	✓
BH10 0.4-0.5m								
Soil Glass Jar - Unpreserved (EP071)								
BH08 0.5-0.6m,	BH11 0.4-0.5m,	**16-Mar-2016**	**22-Mar-2016**	30-Mar-2016	✓	**22-Mar-2016**	01-May-2016	✓
BH11 2.7-2.8m,	BH12 0.3-0.4m,							
BH12 1.5-1.6m,	BH12 2.9-3.0m,							
BH13 0.3-0.4m,	BH13 1.0-1.1m,							
DUP 3								

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
TH01 0.4-0.8m,	TH01 2.5-2.6m,	**15-Mar-2016**	**21-Mar-2016**	29-Mar-2016	✓	**22-Mar-2016**	30-Apr-2016	✓
TH01 4.2-4.5m,	TH02 0.4-0.8m,							
TH03 0.5-0.6m,	TH03 1.5-1.6m,							
TH03 3.2-3.4m,	TH04 0.5-0.6m,							
TH04 3.5-3.6m,	TH05 0.5-0.6m,							
TH05 2.0-2.1m,	TH05 4.5-4.6m,							
TH06 0.5-0.6m,	TH06 2.0-2.1m,							
TH06 4.5-4.6m,	BH07 0.4-0.5m,							
BH07 3.3-3.4m								
Soil Glass Jar - Unpreserved (EP075(SIM))								
Duplicate,	Duplicate 2,	**15-Mar-2016**	**22-Mar-2016**	29-Mar-2016	✓	**22-Mar-2016**	01-May-2016	✓
BH10 2.1-2.2m,	BH10 3.4-3.5m							
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH08 2.5-2.6m,	BH09 0.4-0.5m,	**16-Mar-2016**	**21-Mar-2016**	30-Mar-2016	✓	**22-Mar-2016**	30-Apr-2016	✓
BH10 0.4-0.5m								
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH08 0.5-0.6m,	BH11 0.4-0.5m,	**16-Mar-2016**	**22-Mar-2016**	30-Mar-2016	✓	**22-Mar-2016**	01-May-2016	✓
BH11 2.7-2.8m,	BH12 0.3-0.4m,							
BH12 1.5-1.6m,	BH12 2.9-3.0m,							
BH13 0.3-0.4m,	BH13 1.0-1.1m,							
DUP 3								
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
TH01 0.4-0.8m,	TH01 2.5-2.6m,	**15-Mar-2016**	**18-Mar-2016**	29-Mar-2016	✓	**24-Mar-2016**	29-Mar-2016	✓
TH01 4.2-4.5m,	TH02 0.4-0.8m,							
TH03 0.5-0.6m,	TH03 1.5-1.6m,							
TH03 3.2-3.4m,	TH04 0.5-0.6m,							
TH04 3.5-3.6m,	TH05 0.5-0.6m,							
TH05 2.0-2.1m,	TH05 4.5-4.6m,							
TH06 0.5-0.6m,	TH06 2.0-2.1m,							
TH06 4.5-4.6m,	Duplicate,							
BH07 0.4-0.5m,								
BH07 3.3-3.4m,	Duplicate 2, BH10 2.1-2.2m,							
BH10 3.4-3.5m								
Soil Glass Jar - Unpreserved (EP080)								
BH08 0.5-0.6m,	BH08 2.5-2.6m,	**16-Mar-2016**	**18-Mar-2016**	30-Mar-2016	✓	**24-Mar-2016**	30-Mar-2016	✓
BH09 0.4-0.5m,	BH10 0.4-0.5m,							
BH11 0.4-0.5m,	BH11 2.7-2.8m,							
BH12 0.3-0.4m,	BH12 1.5-1.6m,							
BH12 2.9-3.0m,	BH13 0.3-0.4m,							
BH13 1.0-1.1m,	DUP 3							

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Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
7116-01, 7116-02, 7116-04, 7116-05, duplicate	**15-Mar-2016**	----	----	----	**18-Mar-2016**	11-Sep-2016	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG035F)							
7116-01, 7116-02, 7116-04, 7116-05, duplicate	**15-Mar-2016**	----	----	----	**22-Mar-2016**	12-Apr-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
7116-01, 7116-02, 7116-04, 7116-05, duplicate, rinsate 1, rinsate 2	**15-Mar-2016**	**19-Mar-2016**	22-Mar-2016	✓	**21-Mar-2016**	28-Apr-2016	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
7116-01, 7116-02, 7116-04, 7116-05, duplicate, rinsate 1, rinsate 2	**15-Mar-2016**	**19-Mar-2016**	22-Mar-2016	✓	**21-Mar-2016**	28-Apr-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080)							
7116-01, 7116-02, 7116-04, 7116-05, duplicate, rinsate 1, rinsate 2	**15-Mar-2016**	**22-Mar-2016**	29-Mar-2016	✓	**22-Mar-2016**	29-Mar-2016	✓

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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	6	60	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	7	62	11.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	38	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	38	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	7	72	9.72	10.00	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	36	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	4	62	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	72	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	4	62	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	72	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	4	62	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	72	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	36	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	7.69	10.00	×	NEPM 2013 B3 & ALS QC Standard

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Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
TRH - Semivolatile Fraction	EP071	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	19	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

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Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

Appendix 4 Calibration Record for field equipment

AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration and Service Report – PID

Company:	Geo-Environmental Solutions	**Manufacturer:**	RAE	**Serial #:**	590-902123
Contact:	John-Paul Cumming	**Instrument:**	MINIRAE LITE SN: 590-902123	**Asset #:**	
Address:	86 Queen Street SANDY BAY, TAS	**Model:**	MiniRAE Lite	**Part #:**	-
		Configuration:	VOC	**Sold:**	04.09.2012
		Wireless:	-	**Last Cal:**	18.02.2014
Phone:	03 6223 1839	**Network ID:**	-	**Job #:**	35744
Fax:	03 6223 4539	**Unit ID:**	-	**Cal Spec:**	Standard
Email:	jcumming@geosolutions.net.au	**Details:**	-	**Order #:**	EFT

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P		
Filter	Filter, fitting, etc	F	Replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P		
Datalogger	Operation	P		
Monitor Housing	Condition	P		
Case	Condition / Type	P		
Sensors		P		
PID	Sensor	P	Replaced	
PID	Lamp	P		
THP	THP	P		

Engineer's Report

Service and calibration. Found SUnit is moisture sensitive due to corroded PID sensor. Replace sensor. Replace metal filter.Clean pump and adjust stall settings. Check PC communications, configuration settings and data download. Test sensor response-OK- unit is not moisture sensitive. Fit new inlet filter. Calibrate.

Melbourne	**Head Office**	2 Merchant Avenue	THOMASTOWN VIC 3074	T: +(613) 9464 2300 F:+ (613) 9464 3421
Sydney	S14 Lvl 2	6-8 Holden Street	ASHFIELD NSW 2131	T: +(612) 9716 5966 F:+ (612) 9716 5988
Perth	Unit 6	41 Holder Way	MALAGA WA 6090	T: +(618) 9249 5663 F:+ (618) 9249 5362
Brisbane	Unit 17	23 Ashtan Place	BANYO QLD 4014	T: +(617) 3267 1433 F:+ (617) 3267 3559

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
PID	10.6eV	1062N322047	Isobutylene	100ppm	S110317-1		0	100

Calibrated/Repaired by: MATTHEW WEIGHT Date: 21.06.2017 Next Due: 21.12.2017

Melbourne **Head Office** 2 Merchant Avenue THOMASTOWN VIC 3074 T: +(613) 9464 2300 F: + (613) 9464 3421
Sydney S14 Lvl 2 6-8 Holden Street ASHFIELD NSW 2131 T: +(612) 9716 5966 F: + (612) 9716 5988
Perth Unit 6 41 Holder Way MALAGA WA 6090 T: +(618) 9249 5663 F: + (618) 9249 5362
Brisbane Unit 17 23 Ashtan Place BANYO QLD 4014 T: +(617) 3267 1433 F: + (617) 3267 3559

sales@aesolutions.com.au ISO Certified 9001:2008 www.aesolutions.com.au

AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration and Service Report – PID

Company:	Geo-Environmental Solutions	**Manufacturer:**	RAE	**Serial #:**	590-002123
Contact:	John-Paul Cumming	**Instrument:**	MINIRAE LITE SN: 590-002123	**Asset #:**	
Address:	86 Queen Street SANDY BAY, TAS	**Model:**	MiniRAE Lite	**Part #:**	-
		Configuration:	VOC	**Sold:**	04.09.2012
		Wireless:	-	**Last Cal:**	18.02.2014
Phone:	03 6223 1839	**Network ID:**	-	**Job #:**	22523
Fax:	03 6223 4539	**Unit ID:**	-	**Cal Spec:**	Standard
Email:	jcumming@geosolutions.net.au	**Details:**	-	**Order #:**	TBA

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P		
Filter	Filter, fitting, etc	F	Replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P		
Datalogger	Operation	P		
Monitor Housing	Condition	P		
Case	Condition / Type	P		
Sensors		P		
PID	Sensor	P		
PID	Lamp	P		
THP	THP	P		

Engineer's Report

Service and calibration. Fit new inlet probe- broken. Clean pump and adjust stall settings. Check PC communications, configuration settings and data download. Test sensor response-OK. PID sensor is not moisture senstive.Fit new inlet filter. Calibrate.

Melbourne **Head Office** 2 Merchant Avenue THOMASTOWN VIC 3074 T: +(613) 9464 2300 F: + (613) 9464 3421
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Brisbane Unit 17 23 Ashtan Place BANYO QLD 4014 T: +(617) 3267 1433 F: + (617) 3267 3559

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
PID	10.6eV	1062N322047	Isobutylene	100ppm	S110317-1		0	100

Calibrated/Repaired by: MATTHEW WEIGHT Date: 29.08.2016 Next Due: 28.02.2017

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Service Request

Contact us:	**VIC:**	**2 Merchant Avenue, Thomastown Vic 3074**	**03 9464 2300**
	NSW:	**Lvl 2, Suite 14, 6-8 Holden St, Ashfield 2131**	**02 9716 5966**
	QLD:	**Unit 17, 23 Ashtan Place, Banyo 4014**	**07 3267 1433**
	WA:	**Unit 6, 41 Holder Way, Malaga 6090**	**08 9249 5663**

Email: service@aesolutions.com.au

Your Name:	
Your Company:	
Site Address:	
Suburb:	
Phone:	Fax
Email:	

	Serial Numbers:	**Please advise service required; describe fault, or "Calibration Only"**
1	**Serial #**	
2	**Serial #**	
3	**Serial #**	
4	**Serial #**	
5	**Serial #**	
6	**Serial #**	

Your Purchase Order Number: **value $** Requested Date:

If your instrument requires repairs and/or calibration over this value, you will be quoted and a revised purchase order requested.

For the safety of our staff, please ensure all instruments are decontaminated before sending to AES service dept.

Requested by: _____ **Date:** _____

Please email a copy of this form to service@aesolutions.com.au or place it with your unit when sending to us.

Please contact the service team via telephone on phone **03 9464 2300** if you have any queries.

Melbourne	**Head Office**	2 Merchant Avenue	THOMASTOWN VIC 3074	T: +(613) 9464 2300	F: + (613) 9464 3421
Sydney	514 Lvl 2	6-8 Holden Street	ASHFIELD NSW 2131	T: +(612) 9716 5966	F: + (612) 9716 5988
Perth	Unit 6	41 Holder Way	MALAGA WA 6090	T: +(618) 9249 5663	F: + (618) 9249 5362
Brisbane	Unit 17	23 Ashtan Place	BANYO QLD 4014	T: +(617) 3267 1433	F: + (617) 3267 3559

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration and Service Report – PID

Company:	Geo-Environmental Solutions	**Manufacturer:**	RAE	**Serial #:**	590-902123
Contact:	John-Paul Cumming	**Instrument:**	MiniRAE Lite - 590-902123	**Asset #:**	
Address:	86 Queen Street SANDY BAY, TAS	**Model:**	MiniRAE Lite	**Part #:**	-
		Configuration:	VOC	**Sold:**	04.09.2012
		Wireless:	-	**Last Cal:**	18.02.2014
Phone:	03 6223 1839	**Network ID:**	-	**Job #:**	12894
Fax:	03 6223 4539	**Unit ID:**	-	**Cal Spec:**	
Email:	jcumming@geosolutions.net.au	**Details:**		**Order #:**	TBA

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P	Cleaned,>400 mL/min	
Filter	Filter, fitting, etc	P	Dirty, replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P	1.05B	
Datalogger	Operation	P		
Monitor Housing	Condition	P		
Case	Condition / Type	P	Cleaned	
Sensors				
PID	Lamp	P	Cleaned	
PID	Sensor	P		
THP	Sensor	P	SN:GHTN3W0453	

Engineer's Report

Data download and PC configuration checked O.K.
PID sensor checked if moisture sensitive - passed O.K.
Instrument pump assembly, lamp and rubber boot cleaned.
Pump flow rate >400mL/min.
Unit calibrated and serviceable.

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
PID	10.6eV	1062N322047	Isobutylene	100 PPM	S60311-1		0	100

Calibrated/Repaired by: DARREN FRANCALANZA Date: 07.08.2015 Next Due: 07.02.2016

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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration and Service Report – PID

Company:	Geo-Environmental Solutions	**Manufacturer:**	RAE	**Serial #:**	590-002123
Contact:	John-Paul Cumming	**Instrument:**	MINIRAE LITE SN: 590-002123	**Asset #:**	
Address:	86 Queen Street SANDY BAY, TAS	**Model:**	MiniRAE Lite	**Part #:**	-
		Configuration:	VOC	**Sold:**	04.09.2012
		Wireless:	-	**Last Cal:**	18.02.2014
Phone:	03 6223 1839	**Network ID:**	-	**Job #:**	22523
Fax:	03 6223 4539	**Unit ID:**	-	**Cal Spec:**	Standard
Email:	jcumming@geosolutions.net.au	**Details:**	-	**Order #:**	TBA

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P		
Filter	Filter, fitting, etc	F	Replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P		
Datalogger	Operation	P		
Monitor Housing	Condition	P		
Case	Condition / Type	P		
Sensors		P		
PID	Sensor	P		
PID	Lamp	P		
THP	THP	P		

Engineer's Report

Service and calibration. Fit new inlet probe- broken. Clean pump and adjust stall settings. Check PC communications, configuration settings and data download. Test sensor response-OK. PID sensor is not moisture senstive.Fit new inlet filter. Calibrate.

Melbourne	**Head Office**	2 Merchant Avenue	THOMASTOWN VIC 3074	T: +(613) 9464 2300	F: + (613) 9464 3421
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AES
ACTIVE ENVIRONMENTAL SOLUTIONS

Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
PID	10.6eV	1062N322047	Isobutylene	100ppm	S110317-1		0	100

Calibrated/Repaired by: MATTHEW WEIGHT Date: 29.08.2016 Next Due: 28.02.2017

Melbourne **Head Office** 2 Merchant Avenue THOMASTOWN VIC 3074 T: +(613) 9464 2300 F:+ (613) 9464 3421
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Appendix 5 Soil Bore Logs

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of TH01

EASTING: 527183 GDA94
NORTHING: 5252536 GDA94
ELEVATION: 3.5 m AHD
TOTAL DEPTH (m): 4.5
LOGGED BY: J. Scandrett

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	Bitumen / Concrete																3.5
0.4–0.9	FILL - Mixed sand/clay/gravel, brown, 30-40% fine to coarse gravels	GC	FILL	SM	TH01 0.4-0.8m	Clay	D		<	<	–	<	A	<	<		3.0
0.9–1.2	GRAVEL, brown/grey, slightly moist, medium dense to dense, fine to coarse gravel	GW															2.5
1.2–2.3	Clayey SAND, dark yellow brown, slightly moist, medium dense, 5% wood fragments, slight odor	SC															2.0
2.3–2.8	Sandy CLAY, orange/yellow brown, moist, stiff, low to medium plasticity	CL		M	TH01 2.5-2.6m	Clay	D		<	–	–	–	–	<	–		1.0
2.8–3.0	FILL - Sandstone & red brick fragements	GP		SM													0.5
3.0–3.2	Sandy Silty CLAY, dark brown, moist stiff, medium to high plasticity	CI		M												3.2	0.0
3.2–4.5	Clayey Sandy SILT, dark brown, wet, loose/soft, refusal on likely gravels	ML	Q	W	TH01 4.2-4.5m	CLAY	D		<	–	–	–	–	<	–		-0.5
																	-1.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of TH02

EASTING: 527188 GDA94
NORTHING: 5252543 GDA94
ELEVATION: 3.6 m AHD
TOTAL DEPTH (m): 0.8
LOGGED BY: J. Scandrett

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0	Bitumen																3.5
0.1	Concrete																
0.2																	
0.3																	
0.4	Clayey SAND, brown, slightly moist, medium dense, refusal on likely concrete	SC	FILL	SM	TH02 0.4-0.8m	SAND	D		<	<	<	<	<	<	A		3.0
0.5																	
0.6																	
0.7																	
0.8																	

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of TH03

EASTING: 527192 GDA94
NORTHING: 5252548 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 3.6
LOGGED BY: J. Scandrett

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	0 GRAVEL (FCR), dark grey, slightly moist, dense, fine to coarse gravel (1-20mm)	GW	FILL	SM													3.4
0.1–0.2	SAND, orange/grey, slightly moist, medium dense, 10% fine sand	SW															
0.2–0.5	GRAVEL, dark grey, slightly moist, dense, fine to coarse gravel	GW															
0.5–0.6					TH03 0.5-0.6m	SAND	D		<	<	<	<	<	<	<		
0.6–0.8																	
0.8–1.5	Silty CLAY, mottled yellow brown, black/grey/trace white, slightly moist, stiff, moderate plasticity	Cl															3.0 / 2.5 / 2.0
1.5–1.6	Clayey GRAVEL, orange/grey, slighly moist, medium dense, fine weathered Dolerite gravel	GC			TH03 1.5-1.6m	SAND	D		<	<	–	<	–	<	<		
1.6–2.1																	
2.1–2.5	GRAVEL; & red brick fragments, loose	GP															1.5 / 1.0
2.5–3.4	Clayey Sandy SILT, black/grey, moist to wet, loose/soft,	ML	Q	W	TH03 3.2-3.4m	CLAY	D		<	–	–	–	–	<	–		0.5 / 0.0
3.4–3.5	Silty CLAY, grey/green (anearobic), stiff, high plasticity	CH		M													

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of TH04

EASTING: 527208 GDA94
NORTHING: 5252539 GDA94
ELEVATION: 3.2 m AHD
TOTAL DEPTH (m): 3.6
LOGGED BY: J. Scandrett

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances*: Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	Bitumen																3.0
0.1–0.6	Sandy GRAVEL, yellow brown/grey, slightly moist, medium dense to dense	GW?	FILL		TH04 0.5-0.6m	SAND	D		<	<	<	<	<	<	<		
0.6–1.0	Clayey SAND, light yellow brown, slighly moist, dense	SC															2.5
1.0–1.1	CORE LOSS (Gravel/Rock fragments)	GP															
1.2–2.4	Clayey SAND, dark red brown, slightly moist, dense	SC	Q	SM													2.0
2.5–3.5	Clayey Sandy SILT, dark grey, wet/saturated, loose/soft, 10% fine quartz gravels	ML		W	TH04 3.5-3.6m	CLAY	D		<	–	–	–	–	<	–	3.0	1.5 1.0 0.5 0.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of TH05

EASTING: 527198 GDA94
NORTHING: 5252530 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 4.6
LOGGED BY: J. Scandrett

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.8	Bitumen; Sandy GRAVEL, yellow brown, grey, slightly moist, medium dense	GW	FILL	SM	TH05 0.5-0.6m	SAND	D		<	<	<	<	<	<	<		3.0
0.8–0.9	Concrete																2.5
0.9–1.5	Clayey SAND, yellow/grey, slightly moist, medium dense, 10% fine to medium gravels	SC															2.0
1.5–2.7	Clayey SAND, grey/black, slightly moist, medium dense, 20% fine to medium gravels				TH05 2.0-2.1m	SAND	D		<	<	–	<	–	<	<		1.5
2.7–4.3	Clayey Sandy SILT, dark grey, moist, loose/soft	ML	Q	W												4.3 ▼	1.0 / 0.5 / 0.0 / -0.5
4.3–4.6	Clayey Sandy SILT, grey/green (anearobic), wet/saturated, loose/soft, some carbonate present				TH05 4.5-4.6m	CLAY	D		<	–	–	–	–	<	–		-1.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of TH06

EASTING: 527191 GDA94
NORTHING: 5252522 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 4.6
LOGGED BY: J. Scandrett

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	Bitumen																
0.1–1.5	FILL - SANDY GRAVEL, yellow brown, grey, slightly moist, medium dense	GW	FILL	SM	TH06 0.5-0.6m	SAND	D		<	<	<	<	<	<	<		3.0 to -0.5
1.2–1.4	FILL - Gravels & red brick fragments, loose	GP															
1.5–2.4	FILL - CLAYEY SAND, grey/black, slightly moist, medium dense, 20% fine to medium gravels, pottery fragment encountered	SC			TH06 2.0-2.1m	SAND	D		<	<	–	<	–	<	<		
2.5–4.6	Sandy CLAYEY SILT, dark grey, moist to wet (saturated at 3.6m), soft, some organics, 10% fine quartz gravels	MH	Q	W	TH06 4.5-4.6m	CLAY	D		<	–	–	–	–	<	–	3.6 ▼	-1.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH07

EASTING: 527216 GDA94
NORTHING: 5252549 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 3.6
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 15/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.3	Concrete																3.4
0.4–2.4	FILL - CORE LOSS (Sandy GRAVEL, grey/brown, slightly moist, loose)	GP	FILL	SM	BH07 0.4-0.5m	SAND	D		<	<	<	<	<	<	A		3.0 / 2.5 / 2.0 / 1.5 / 1.0
2.4–3.0	FILL - Gravelly CLAYEY SAND, orange/brown, moist, medium dense, fine to coarse (2-20mm) gravels	SC		M													0.5
3.0–3.5	Sandy CLAYEY SILT, dark grey/black, moist to wet (saturated at 3.4m), soft, some organics, 10% fine quartz gravels, Refusal on	MH	Q	W	BH07 3.3-3.4m	CLAY	D		<	–	–	–	–	<	–	3.4 ▼	0.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH08

EASTING: 527235 GDA94
NORTHING: 5252564 GDA94
ELEVATION: 2.9 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 16/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0	Concrete																
0.1																	
0.2	FILL - GRAVELLY SAND, dark brown/black, slightly moist, medium dense, fine to medium gravels	SW		SM													
0.3																	
0.4	FILL - RED BRICKS			D													
0.5	FILL - SILTY CLAY, olive brown/grey, moist, stiff, medium to high plasticity	CH		M	BH08 0.5-0.6m	CLAY	D		<	<	–	<	<	<	<		2.5
0.6																	
0.7	FILL - GRAVELLY SAND, olive brown/grey, slightly moist, medium dense, fine to medium gravels	SW		SM													
0.8																	
0.9	FILL - SILTY CLAY, olive brown/grey, moist, stiff, medium to high plasticity, 10% fine to medium gravels, trace carbonate																
1.0																	2.0
1.1																	
1.2																	
1.3																	
1.4																	1.5
1.5		CH	FILL	M													
1.6																	
1.7																	
1.8																	
1.9																	1.0
2.0																	
2.1																	
2.2																	
2.3	FILL - CLAYEY GRAVEL, orange/grey, slighly moist, medium dense to dense, fine to coarse weathered Dolerite gravel (2-30mm), Ref	GC		SM	BH08 2.5-2.6m	SAND	D		<	<	–	<	–	<	<		0.5
2.4																	
2.5																	
2.6																	
2.7																	
2.8																	
2.9																	0.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH09

EASTING: 527241 GDA94
NORTHING: 5252580 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 0.6
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 16/3/2016
CONTRACTOR: GES
EQUIPMENT/METHOD: Motorised Percussion Sampler SAMPLING: Direct Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0	Concrete																
0.1																	
0.2																	
0.3	FILL - GRAVEL, grey, dry, dense, fine to coarse Dolerite gravels (1-30mm), some red brick fragments	GW	FILL	D													
0.4				M	BH09 0.4-0.5m	CLAY	D		<	<	–	<	<	<	<		3.0
0.5	FILL - SANDY CLAY, dark brown, moist, stiff, medium plasticity, some red brick fragments	CI		SM													
0.6	FILL - CLAYEY GRAVEL, brown/grey, slightly moist, dense, Refusal on gravels	GC															

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH10

EASTING: 527204 GDA94
NORTHING: 5252562 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 4.6
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 16/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.3	Concrete		FILL														
0.4–0.9	FILL - Sandy CLAYEY GRAVEL, dark brown/grey, moist, medium dense, fine to coarse gravels (1-30mm)	GC		M	BH10 0.4-0.5m	SAND	D		<	<	<	<	<	<	A		3.0
1.0–1.3	FILL - SANDY CLAY, dark grey/black, moist, very stiff, medium to high plasticity, 10% fine to coarse gravels (1-20mm)	Cl															2.5
1.4–1.6	FILL - CLAYEY SAND, yellow/orange brown, slightly moist, medium dense	SC		SM													2.0
1.7–1.9	FILL - Sandy SILTY CLAY, orange/brown, moist, stiff, medium plasticity	Cl															1.5
2.0–2.6	FILL - Gravelly SANDY CLAY, orange/brown, moist, stiff, low plasticity, trace (5%) Silt, fine to coarse gravels (1-10mm)	CL			BH10 2.1-2.2m	SAND	D	43.0	<	<	–	<	–	<	<		1.0
2.7–3.2	FILL - Sandy SILTY CLAY, brown, moist, firm, medium to high plasticity	Cl		M													0.5
3.3–4.2	Sandy CLAYEY SILT, black, moist to wet, soft, lense of coarse (Quartz) Clayey Sand, moisture increase at 3.7m	MH	Q		BH10 3.4-3.5m	CLAY	D	121.0	A	–	–	–	–	<	–	3.7 ▼	0.0
4.3–4.6	SILTY CLAY, green/grey (anearobic), moist, stiff, high plasticity, 5% fine to medium gravels, 5% carbonate	CH		W													-0.5
																	-1.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH11

EASTING: 527211 GDA94
NORTHING: 5252575 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 16/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.3	Concrete																
0.4–1.0	FILL - GRAVEL (FCR), dark grey, slightly moist, dense, fine to coarse gravel (1-20mm)	GW		SM	BH11 0.4-0.5m	SAND	D		<	<	<	<	<	<	<		3.0–2.5
1.0–2.2	FILL - Gravelly CLAYEY SAND, yellow/orange, slightly moist, medium dense, fine to coarse (1-20mm) gravel	SC	FILL	M													2.5–2.0
2.2–2.4	FILL - Sandy SILTY CLAY, brown/grey, moist, stiff, medium to high plasticity	CI															2.0–1.5
2.4–2.9	FILL - Gravelly CLAYEY SAND, yellow orange/brown/grey, slightly moist, dense, fine to coarse gravel (1-30mm), Refusal on large	SC			BH11 2.7-2.8m	SAND	D		<	<	–	<	–	<	<		1.5–1.0–0.5

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH12

EASTING: 527217 GDA94
NORTHING: 5252566 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 3.3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 16/3/2016
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances*: Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	Concrete		FILL	D													
0.2–0.3	FILL - Concrete rubble																
0.3–0.4	FILL - Gravelly SAND, dark brown/black, slightly moist, medium dense	SW		SM	BH12 0.3-0.4m	SAND	D		<	<	<	<	<	<	<		3.0
0.4–0.5	FILL - CLAYEY SAND, orange/brown, moist, medium dense	SC															
0.5–0.7																	
0.7–1.2	FILL - Mixed GRAVEL/CLAY/SAND, dark brown/grey, moist, medium dense/stiff, assorted debris, Low plasticity	CL															2.5
1.2–1.5	FILL - Sandy SILTY CLAY, olive brown/grey, moist, firm, medium to high plasticity, 10% fine to medium gravels & brick fragments	CH															2.0
1.5–1.6					BH12 1.5-1.6m	CLAY	D		<	–	–	<	–	<	–		
1.6–2.9				M													1.5–1.0
2.9–3.0					BH12 2.9-3.0m	CLAY	D		<	–	–	–	–	<	–		0.5
3.0–3.2																	

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH13

EASTING: 527225 GDA94
NORTHING: 5252580 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 1.1
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 16/3/2016
CONTRACTOR: GES
EQUIPMENT/METHOD: Hand Auger SAMPLING: Hand Auger

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	Concrete																
0.1–0.8	FILL - Gravelly CLAYEY SAND, dark brown/red (from bricks), slightly moist, medium dense, fine to coarse (1-20mm) gravel, assort	SC	FILL	SM	BH13 0.3-0.4m	SAND	D		<	<	<	<	<	<	<		3.0
0.8–0.9	FILL - SANDY CLAY, brown/grey, moist, stiff, semi-friable, medium plasticity	CI		M													2.5
0.9–1.1	FILL - Gravelly CLAYEY SAND, dark brown/grey, slightly moist, dense, fine to coarse (1-20mm) gravel, Refusal on likely boulder	SC		SM	BH13 1.0-1.1m	SAND	D		<	<	–	<	–	<	<		

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH14

EASTING: 527210.5 GDA94
NORTHING: 5252568.1 GDA94
ELEVATION: 3.6 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.2	FILL - Concrete	P															3.5
0.3–0.4	FILL - Sandy GRAVEL: grey/pale brown, slightly moist, medium dense to dense	GW		SM													
0.4–0.5	FILL - Sandy CLAY: dark brown, moist, very stiff, medium plasticity	Cl		M													
0.5–0.6	FILL - Sandy GRAVEL: grey/brown, slightly moist, dense	GW		SM	BH14 0.5-0.6	CLAY	D		<	<	<	<	<	<	I		3.0
0.7–1.0	FILL - Sandy CLAY: dark brown, moist, very stiff, medium plasticity	Cl		M													2.5
1.3–2.5	FILL - Predominantly Clayey SAND with some Sandy CLAY lenses: orange/pale grey, slightly moist, dense. (Clay fraction is dark b	SC	FILL	SM	BH14 2.5-2.6	SAND	D		<	<	<	<	<	<	<		2.0
																	1.5
																	1.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH15

EASTING: 527178.4 GDA94
NORTHING: 5252542.8 GDA94
ELEVATION: 3.5 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.1	FILL - Concrete	P	FILL	SM													3.5
0.2–1.2	FILL - Mixed Sand/Clay/Gravel: dark brown, slightly moist, medium dense	GC			BH15 0.5-0.6	SAND	D		<	<	<	<	<	<	<		3.0
1.2–1.6	FILL - Sandy GRAVEL: grey/pale brown, slightly moist, medium dense to dense	GW															2.5
1.6–2.0	FILL - Clayey SAND: dark brown, slightly moist, medium dense, 40% Clay	SC															2.0
2.0–2.2	FILL - Sandy GRAVEL: grey/brown, slightly moist, dense	GW															1.5
2.2–2.9	FILL - Clayey SAND: pale brown/dark grey, slightly moist, medium dense	SC			BH15 2.5-2.6	SAND	D		<	<	<	<	<	<	<		1.0
																	0.5

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH16

EASTING: 527177.7 GDA94
NORTHING: 5252530.3 GDA94
ELEVATION: 3.1 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0	FILL - Bitumen	P	FILL	SM													3.0
0.1	FILL - Concrete																
0.2	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, (some brick fragments at 0.70m), fine to coarse	SC															
0.3																	
0.4																	
0.5					BH16 0.5-0.6	SAND	D		<	<	<	<	<	<	1		
0.6																	2.5
0.7																	
0.8																	
0.9																	
1.0																	
1.1																	2.0
1.2																	
1.3																	
1.4																	
1.5																	
1.6	FILL - Sandy GRAVEL: grey/brown, slightly moist, dense	GW															1.5
1.7																	
1.8	FILL - Sandy CLAY: dark grey-brown, moist, very stiff, low to medium plasticity	CI		M													
1.9																	
2.0																	
2.1																	1.0
2.2																	
2.3																	
2.4																	
2.5					BH16 2.5-2.6	SAND	D		<	<	<	<	<	<	<		
2.6																	0.5
2.7																	
2.8																	
2.9																	

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH17

EASTING: 527202.6 GDA94
NORTHING: 5252545.9 GDA94
ELEVATION: 3.3 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0	FILL - Bitumen	P	FILL														3.0
0.1	FILL - Sandy GRAVEL: grey/brown/trace red, slightly moist, medium dense to dense	GW															
0.5					BH17 0.5-0.6	SAND	D		<	<	<	<	<	<	I		
0.8	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, (some brick fragments at 0.70m), fine to coarse	SC		SM													2.5
1.5	FILL - Sandy Silty CLAY: pale brown/grey, moist, firm to stiff, medium to high plasticity	CH		M													2.0
2.1	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, fine to coarse angular gravel	SC		SM													1.5
2.5					BH17 2.5-2.6	SAND	D		<	<	<	<	<	<	<		1.0
2.6	FILL - Silty SAND: dark grey, wet, medium dense	SM		W													0.5

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH18

EASTING: 527199.9 GDA94
NORTHING: 5252564.6 GDA94
ELEVATION: 3.6 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.4	FILL - Concrete	P	FILL														3.5
0.4–0.8	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, fine to coarse angular gravel	SC		SM	BH18 0.5-0.6	CLAY	D		<	<	<	<	–	<	–		3.0
0.8–1.1	FILL - Silty Sandy CLAY: pale brown/trace grey, moist, stiff, medium plasticity	Cl		M													2.5
1.1–1.8	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, fine to coarse angular gravel	SC		SM													2.0
1.8–2.2	FILL - Silty Clayey SAND: pale brown/ slightly moist, dense to Refusal. Possible Sandstone cobble/boulder				BH18 2.1-2.2	SAND	D		<	<	<	<	–	<	<		1.5
																	1.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH19

EASTING: 527211 GDA94
NORTHING: 5252555.3 GDA94
ELEVATION: 3.5 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances*: Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.4	FILL - Concrete	P	FILL														3.5
0.5–0.9	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, fine to coarse angular gravel	SC			BH19 0.5-0.6	CLAY	D		<	<	<	<	<	<	<		3.0
0.9–1.4	FILL - Sandy GRAVEL: grey/brown/trace red, slightly moist, medium dense to dense	GW		SM													2.5
1.5–1.6	FILL - Sandy CLAY: dark brown, moist, very stiff, medium plasticity	Cl		M													2.0
1.7–1.9	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, fine to coarse angular gravel	SC		SM													
2.0–2.9	FILL - Sandy CLAY: dark brown, moist, very stiff, medium plasticity, some fine to coarse angular gravel throughout	Cl		M	BH19 2.5-2.6	SAND	D		<	<	<	<	<	<	<		1.5 1.0 0.5

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH20

EASTING: 527223.8 GDA94
NORTHING: 5252554.9 GDA94
ELEVATION: 2.6 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.4	FILL - Concrete	P															2.5
0.5–1.4	FILL - Gravelly Clayey SAND: dark brown/brown/trace grey, slightly moist, medium dense to dense, fine to coarse angular gravel	SC	FILL	SM	BH20 0.5-0.6	CLAY	D		<	<	<	<	<	<	<		2.0 / 1.5
1.5–2.9	FILL - Sandy CLAY: dark brown, moist, very stiff, medium plasticity, some Clayey Sand pockets, fine to coarse angular gravel th	Cl		M	BH20 2.5-2.6	CLAY	D		<	<	<	<	<	<	<		1.0 / 0.5 / 0.0

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH21

EASTING: 527220.3 GDA94
NORTHING: 5252546.1 GDA94
ELEVATION: 3.5 m AHD
TOTAL DEPTH (m): 3
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0–0.4	FILL - Concrete	P	FILL														3.5
0.4–1.1	FILL - Gravelly Clayey SAND: dark brown/brown/trace grey, slightly moist, medium dense to dense, fine to coarse angular gravel,	SC		SM	BH21 0.5-0.6	CLAY	D		<	<	<	<	–	<	–		3.0
1.1–2.7	FILL - Gravelly Sandy CLAY: dark brown/dark grey, moist, firm to stiff, medium plasticity, fine to coarse angular gravel	CI		M	BH21 2.1-2.2	CLAY	D		<	<	<	<	–	<	<		2.5 / 2.0 / 1.5 / 1.0
2.7–2.9	FILL - Silty Clayey SAND: pale brown/ slightly moist, dense to Refusal. Possible Sandstone cobble/boulder	SC		SM													0.5

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

GES GEO-ENVIRONMENTAL SOLUTIONS

PROJECT: 2 Collins Street Hobart
CLIENT: Fragrance Group Ltd

Log of BH22

EASTING: 527195.9 GDA94
NORTHING: 5252552.3 GDA94
ELEVATION: 3.4 m AHD
TOTAL DEPTH (m): 0.9
LOGGED BY: A. Plummer

LOCATION: Hobart DATE: 04/08/2017
CONTRACTOR: Geo Environmental Solutions
EQUIPMENT/METHOD: Geoprobe SAMPLING: Push Tube

DEPTH (metres)	MATERIAL DESCRIPTION	USCS LITHOLOGY	UNIT	MOISTURE	SAMPLES: Sample	Grain Class	HSL	Field PID (ppm)	Helath Screening Level Exceedances* Benzene	Toluene	Ethylbenz.	Xylene	Napthalene	F1	F2	MONITORING WELL	ELEVATION (metres)
0.0	FILL - Bitumen	P															
0.1	FILL - Sandy GRAVEL: grey/brown/trace red, slightly moist, medium dense to dense	GW	FILL	SM	BH22 0.5-0.6	SAND	D		<	<	<	<	<	<	<		
0.7	FILL - Gravelly Clayey SAND: dark brown, slightly moist, medium dense to dense, (some brick fragments at 0.70m), fine to coarse	SC															3.0
0.9																	2.5

Geo-Environmental Solutions

* PVI HSL EXCEEDANCE: X: EXCAVATION; < IL; - NL; A: 1-2; B: 2-5; C: 5-20; D: 20-50; E: 50-200; F: 200-500; G: >500

Appendix 6 Groundwater Purge Records

GROUNDWATER MONITORING LOG

Client: Fragrance Group — Date/Time: 4-6-17
Job No: 2 Collins Street — Sampled by: A. Hunter

Borehole No: 7116 - 05 — Easting: 0 — Northing: 0
Surface RL (m): 0 — Estimated Bore Yield (l/m): 0 — Weather Conditions:
Hole Depth RL (m): 6.38 — Height of Collar (mm): 0 — Temperature:
Groundwater Depth RL (m) 0 — Diameter of Bore (mm): 50 (50mm/65mm) — Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 6.38 A
Groundwater Depth (m): 2.52 B
Water Column Volu 7.12 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 21.36 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	10:50	11:10	
Finish Time	11:00	11:20	
Minutes	10	10	
Volume (L)	8	8	
Recovery Time Minutes			

Total Volume Purged (L): 16
Recovery Rate (L/m)

Site Water Quality Measurements:	Cycle 1	Cycle 2	Cycle 3	Calibration:	Comments:
Temperature (oC)	13.2	13.4			
pH (units)	7.43	7.38			
Redox Potential (mV)	208.2	210.1			
Conductivity (uS/cm)	1394	1374			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: — Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

Client: — Date/Time:
Job No: — Sampled by:

Borehole No: MW6 — Easting: 0 — Northing: 0
Surface RL (m): 0 — Estimated Bore Yield (l/m) 0 — Weather Conditions:
Hole Depth RL (m): 0 — Height of Collar (mm): 0 — Temperature:
Groundwater Depth RL (m) 0 — Diameter of Bore (mm): 25 (50mm/65mm) — Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 0 A
Groundwater Depth (m): B
Water Column Volume: (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time			
Finish Time			
Minutes			
Volume (L)			
Recovery Time Minutes			

Total Volume Purged (L)
Recovery Rate (L/m)

Site Water Quality Measurements:	Cycle 1	Cycle 2	Cycle 3	Calibration:	Comments:
Temperature (oC)					
pH (units)					
Redox Potential (mV)					
Conductivity (uS/cm)					
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: — Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fragrance Group | Date/Time: 4-5-17
Job No: 2 Collins Street | Sampled by: A. Plumm

Borehole No: 7116 - 03 | Easting: 0 | Northing: 0
Surface RL (m): | Estimated Bore Yield (l/m): | Weather Conditions:
Hole Depth RL (m): 3.92 | Height of Collar (mm): | Temperature:
Groundwater Depth RL (m) | Diameter of Bore (mm): 50 (50mm/65mm) | Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 3.92 A
Groundwater Depth (m): 2.937 B
Water Column Volum 1.966 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 5.898 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	9:00	9:10	9:20
Finish Time	9:05	9:15	9:25
Minutes	5	5	5
Volume (L)	2	1.5	1.5
Recovery Time Minutes			

Total Volume Purged (L) 5
Recovery Rate (L/m)

Site Water Quality Measurements:	Cycle 1	Cycle 2	Cycle 3	Calibration:	Comments:
Temperature (oC)	13.4	13.80	13.7		
pH (units)	7.10	7.14	7.19		
Redox Potential (mV)	-2.0	66.3	91.0		
Conductivity (uS/cm) mS	4.97	2.62	2095 uS		
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: | Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fragrance Grop | Date/Time: 4-5-17
Job No: 2 Collins Street | Sampled by: A. Plumm

Borehole No: 7116 - 04 | Easting: 0 | Northing: 0
Surface RL (m): | Estimated Bore Yield (l/m) | Weather Conditions:
Hole Depth RL (m): 6.29 | Height of Collar (mm) | Temperature:
Groundwater Depth RL (m) | Diameter of Bore (mm): 50 (50mm/65mm) | Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 6.29 A
Groundwater Depth (m): 2.11 B
Water Column Volume 8.36 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 25.08 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	10:00	10:20	X DRY
Finish Time	10:10	10:30	
Minutes	10	10	
Volume (L)	8	9	
Recovery Time Minutes			

Total Volume Purged (L) 17
Recovery Rate (L/m)

Site Water Quality Measurements:	Cycle 1	Cycle 2	Cycle 3	Calibration:	Comments:
Temperature (oC)	13.6	14.4			
pH (units)	7.57	7.74			
Redox Potential (mV)	191.9	238.9			
Conductivity (uS/cm)	1701	1663			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: | Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fairbrother Pty Ltd | Date/Time: 16/03/2016
Job No: 2 Collins Street | Sampled by: J Scandrett

Borehole No: **7116 - 01** | Easting: | Northing:
Surface RL (m): | Estimated Bore Yield (l/m) | Weather Conditions:
Hole Depth RL (m): | Height of Collar (mm): | Temperature:
Groundwater Depth RL (m) | Diameter of Bore (mm): (50mm/65mm) | Rainfall 7 Days (mm): | Station:

Measurements from top of collar:
Borehole Depth (m): 5.47 A
Groundwater Depth (m): 2.91 B
Water Column Volume: 2.56 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 15.3 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	10:50	10:53	
Finish Time	10:52	10:54	
Minutes	1	1	
Volume (L)	8	7	
Recovery Time Minutes			

Total Volume Purged (L) 15
Recovery Rate (L/m)

Site Water Quality Measurements:				Calibration:	Comments:
Temperature (oC)	17.5	16.9			
pH (units)	6.89	6.67			
Redox Potential (mV)	12.5	-23			
Conductivity (uS/cm)	1058	1446			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: | Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fairbrother Pty Ltd | Date/Time: 16/03/2016
Job No: 2 Collins Street | Sampled by: J Scandrett

Borehole No: **7116 - 02** | Easting: 0 | Northing: 0
Surface RL (m): | Estimated Bore Yield (l/m) | Weather Conditions:
Hole Depth RL (m): 3.47 | Height of Collar (mm): | Temperature:
Groundwater Depth RL (m) | Diameter of Bore (mm): 50 (50mm/65mm) | Rainfall 7 Days (mm): | Station:

Measurements from top of collar:
Borehole Depth (m): 3.47 A
Groundwater Depth (m): 3.13 B
Water Column Volume: 0.34 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 2.04 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	10:59	11:02	
Finish Time	11 am	11:07	
Minutes	1	1	
Volume (L)	1	1	
Recovery Time Minutes			

Total Volume Purged (L) 2
Recovery Rate (L/m)

Site Water Quality Measurements:				Calibration:	Comments:
Temperature (oC)	15.4	14.8			
pH (units)	7.26	7.42			
Redox Potential (mV)	1.4	32			
Conductivity (uS/cm)	2730	5510			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity	✓				
Odour	no				
Colour					
Sheen					

Sampling Details:
Sample Number: | Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fairbrother Pty Ltd — Date/Time: 16/03/2016
Job No: 2 Collins Street — Sampled by: J Scandrett

Borehole No: 7116 - 03 — Easting: 0 — Northing: 0
Surface RL (m): — Estimated Bore Yield (l/m) — Weather Conditions:
Hole Depth RL (m): 3.92 — Height of Collar (mm): — Temperature:
Groundwater Depth RL (m) — Diameter of Bore (mm): 50 (50mm/65mm) — Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 3.92 A
Groundwater Depth (m): 3.28 B
Water Column Volume: 0.64 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 3.84 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	11:15	11:18	
Finish Time	11:16	11:19	
Minutes	1	1	
Volume (L)	2	1.8	
Recovery Time Minutes			

Total Volume Purged (L) 3.8
Recovery Rate (L/m)

Site Water Quality Measurements:				Calibration:	Comments:
Temperature (oC)	17.2	16.7			
pH (units)	7.44	7.25			
Redox Potential (mV)	21.4	90.6			
Conductivity (uS/cm)	3910	3820			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: — Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fairbrother Pty Ltd — Date/Time: 16/03/2016
Job No: 2 Collins Street — Sampled by: J Scandrett

Borehole No: 7116 - 04 — Easting: 0 — Northing: 0
Surface RL (m): — Estimated Bore Yield (l/m) — Weather Conditions:
Hole Depth RL (m): 6.29 — Height of Collar (mm): — Temperature:
Groundwater Depth RL (m) — Diameter of Bore (mm): 50 (50mm/65mm) — Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 6.29 A
Groundwater Depth (m): 2.62 B
Water Column Volume: 3.67 (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 22 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	11:25	11:27	
Finish Time	11:26	11:28	
Minutes	1	1	
Volume (L)	11	11	
Recovery Time Minutes			

Total Volume Purged (L) 22
Recovery Rate (L/m)

Site Water Quality Measurements:				Calibration:	Comments:
Temperature (oC)	16.4	16.9			
pH (units)	6.92	7.15			
Redox Potential (mV)	200	210			
Conductivity (uS/cm)	1973	1379			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number: — Sample Bottles: Total No.
Sampling Time:

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments: Dry @ end of 2nd cycle.

GROUNDWATER MONITORING LOG

GES GEO-ENVIRONMENTAL SOLUTIONS

Client: Fairbrother Pty Ltd
Job No: 2 Collins Street
Date/Time: 16/03/2016
Sampled by: J Scandrett

Borehole No: 7116 - 05
Surface RL (m): 0
Hole Depth RL (m): 6.38
Groundwater Depth RL (m) 0
Easting: 0
Estimated Bore Yield (l/m) 0
Height of Collar (mm): 0
Diameter of Bore (mm): 50 (50mm/65mm)
Northing: 0
Weather Conditions:
Temperature:
Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 6.38 A
Groundwater Depth (m): 3.20 B
Water Column Volume: (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): 19.1 (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time	12:01	12:05	
Finish Time	12:02	12:06	
Minutes	1	1	
Volume (L)	10	10	
Recovery Time Minutes			

Total Volume Purged (L) 20
Recovery Rate (L/m)

Site Water Quality Measurements:				Calibration:	Comments:
Temperature (oC)	17.5	16.5			
pH (units)	7.68	7.51			
Redox Potential (mV)	225	210			
Conductivity (uS/cm)	1289	1281			
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number:
Sampling Time:
Sample Bottles: Total No.

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

GES GEO-ENVIRONMENTAL SOLUTIONS

GROUNDWATER MONITORING LOG

Client: Fairbrother Pty Ltd
Job No:
Date/Time: 16/03/2016
Sampled by: J Scandrett

Borehole No:
Surface RL (m): 0
Hole Depth RL (m): 0
Groundwater Depth RL (m) 0
Easting: 0
Estimated Bore Yield (l/m) 0
Height of Collar (mm): 0
Diameter of Bore (mm): 25 (50mm/65mm)
Northing: 0
Weather Conditions:
Temperature:
Rainfall 7 Days (mm):
Station:

Measurements from top of collar:
Borehole Depth (m): 0 A
Groundwater Depth (m): B
Water Column Volume: (A-B) x F x3 =
50mm: F=2 / 65mm: F=x3.3

Bore Water Purging:
Purging Method: Peristaltic
Sampling Method: Peristaltic
Volume to be Purged (L): (Min. x3 Water Volume)

Purging Cycles:	Cycle 1	Cycle 2	Cycle 3
Start Time			
Finish Time			
Minutes			
Volume (L)			
Recovery Time Minutes			

Total Volume Purged (L)
Recovery Rate (L/m)

Site Water Quality Measurements:				Calibration:	Comments:
Temperature (oC)					
pH (units)					
Redox Potential (mV)					
Conductivity (uS/cm)					
Salinity (mg/L)					
Dissolved Oxygen (%)					
Dissolved Oxygen (mg/L)					
Turbidity					
Odour					
Colour					
Sheen					

Sampling Details:
Sample Number:
Sampling Time:
Sample Bottles: Total No.

1000mL plastic (non-pres)	x1 Green	250mL plastic (Cd Nitrate)	x1 Blue	/Add NaOH
500mL amber glass (non-pres)	x1 Orange	125mL plastic (sulph acid)	x1 Purple	
40mL amber glass (sulph acid)	x2 Maroon	60mL plastic (non-pres)	x2 Red/Green	
40mL amber glass (sulph acid)	x1 Purple	600mL plastic (Na bisulph)	x1 Grey	

General Comments:

Appendix 7 Soil & Groundwater Certificate of Analysis

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: EM1710504	Page	: 1 of 19
Client	: GEO-ENVIRONMENTAL SOLUTIONS	Laboratory	: Environmental Division Melbourne
Contact	: S JOYCE	Contact	: Shirley LeCornu
Address	: 86 QUEEN STREET SANDY BAY TASMANIA, AUSTRALIA 7005	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6223 1839	Telephone	: +61-3-8549 9630
Project	: 2 Collins Street	Date Samples Received	: 08-Aug-2017 11:45
Order number	: ----	Date Analysis Commenced	: 08-Aug-2017
C-O-C number	: ----	Issue Date	: 11-Aug-2017 13:14
Sampler	: AARON PLUMMER		
Site	: ----		
Quote number	: Blanket quote 2017		
No. of samples received	: 35		
No. of samples analysed	: 27		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC

RIGHT SOLUTIONS | RIGHT PARTNER

Page	: 2 of 19
Work Order	: EM1710504
Client	: GEO-ENVIRONMENTAL SOLUTIONS
Project	: 2 Collins Street

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Particular samples (EM-1710504-023,035) show minor BTEX hits. Confirmed by re-analysis.
- EG035T: EM1710404-001 Poor duplicate precision for total mercury due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EG035T: EM1710404-001 Poor matrix spike recovery for total mercury due to sample matrix. Confirmed by re-extraction and re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH14 0.5-0.6	BH14 2.5-2.6	BH15 0.5-0.6	BH15 2.5-2.6	BH16 0.5-0.6
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-009	EM1710504-011	EM1710504-012	EM1710504-014	EM1710504-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		9.5	10.6	11.8	15.4	9.3
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		12	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		120	<10	90	70	130
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		17	5	12	9	12
Cobalt	7440-48-4	2	mg/kg		17	10	16	9	19
Copper	7440-50-8	5	mg/kg		92	6	109	44	73
Lead	7439-92-1	5	mg/kg		227	12	125	126	192
Manganese	7439-96-5	5	mg/kg		373	135	279	245	326
Nickel	7440-02-0	2	mg/kg		23	9	16	8	15
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		53	16	50	45	44
Zinc	7440-66-6	5	mg/kg		146	26	99	44	157
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.6	<0.1	0.2	1.1	1.6
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		1.3	<0.5	1.1	<0.5	1.8
Acenaphthylene	208-96-8	0.5	mg/kg		6.6	<0.5	4.7	<0.5	11.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	0.8
Fluorene	86-73-7	0.5	mg/kg		1.4	<0.5	1.4	<0.5	4.1
Phenanthrene	85-01-8	0.5	mg/kg		23.0	<0.5	17.3	1.2	50.9
Anthracene	120-12-7	0.5	mg/kg		7.6	<0.5	6.7	<0.5	14.1
Fluoranthene	206-44-0	0.5	mg/kg		39.0	0.6	36.2	1.5	58.2
Pyrene	129-00-0	0.5	mg/kg		43.3	0.7	37.7	1.5	61.0
Benz[a]anthracene	56-55-3	0.5	mg/kg		25.6	<0.5	20.4	0.8	33.1
Chrysene	218-01-9	0.5	mg/kg		22.5	<0.5	17.3	0.6	27.2
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		30.5	<0.5	25.0	0.8	32.4
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		11.4	<0.5	8.6	<0.5	9.9
Benzo(a)pyrene	50-32-8	0.5	mg/kg		27.2	<0.5	21.0	0.7	27.0
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		10.1	<0.5	7.7	<0.5	8.8
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		3.0	<0.5	2.2	<0.5	2.6

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH14 0.5-0.6	BH14 2.5-2.6	BH15 0.5-0.6	BH15 2.5-2.6	BH16 0.5-0.6
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-009	EM1710504-011	EM1710504-012	EM1710504-014	EM1710504-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		13.5	<0.5	9.7	<0.5	10.7
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		266	1.3	217	7.1	354
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		38.3	<0.5	29.6	0.9	38.4
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		38.3	0.6	29.6	1.2	38.4
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		38.3	1.2	29.6	1.5	38.4
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		1110	<100	820	<100	1180
C29 - C36 Fraction	----	100	mg/kg		720	<100	480	<100	730
^ C10 - C36 Fraction (sum)	----	50	mg/kg		1830	<50	1300	<50	1910
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		70	<50	<50	<50	90
>C16 - C34 Fraction	----	100	mg/kg		1600	<100	1140	<100	1640
>C34 - C40 Fraction	----	100	mg/kg		350	<100	220	<100	400
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		2020	<50	1360	<50	2130
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		70	<50	<50	<50	90
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		108	109	102	99.2	103
2-Chlorophenol-D4	93951-73-6	0.5	%		95.2	95.8	89.6	92.3	95.0
2.4.6-Tribromophenol	118-79-6	0.5	%		98.7	95.4	91.6	91.5	102

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH14 0.5-0.6	BH14 2.5-2.6	BH15 0.5-0.6	BH15 2.5-2.6	BH16 0.5-0.6
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-009	EM1710504-011	EM1710504-012	EM1710504-014	EM1710504-015
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		106	105	99.2	102	106
Anthracene-d10	1719-06-8	0.5	%		112	113	105	112	105
4-Terphenyl-d14	1718-51-0	0.5	%		120	116	110	117	123
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		88.1	86.6	85.8	81.6	82.2
Toluene-D8	2037-26-5	0.2	%		83.2	82.3	79.4	72.5	74.5
4-Bromofluorobenzene	460-00-4	0.2	%		85.1	87.4	85.0	82.4	81.2

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16 2.5-2.6	BH17 0.5-0.6	BH17 2.5-2.6	BH18 0.5-0.6	BH18 2.1-2.2
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-017	EM1710504-018	EM1710504-020	EM1710504-021	EM1710504-023
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		15.2	7.1	25.7	12.3	9.2
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		80	80	60	80	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	2	<1	3	<1
Chromium	7440-47-3	2	mg/kg		8	5	9	10	9
Cobalt	7440-48-4	2	mg/kg		8	7	8	15	15
Copper	7440-50-8	5	mg/kg		24	78	38	62	15
Lead	7439-92-1	5	mg/kg		91	1270	46	1600	45
Manganese	7439-96-5	5	mg/kg		153	277	237	434	160
Nickel	7440-02-0	2	mg/kg		8	8	8	13	12
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		36	24	35	41	17
Zinc	7440-66-6	5	mg/kg		23	527	23	314	75
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.2	0.2	0.6	0.3	0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		0.7	0.6	3.2	4.0	0.7
Acenaphthylene	208-96-8	0.5	mg/kg		1.3	4.0	1.2	10.3	1.7
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	1.4	<0.5
Fluorene	86-73-7	0.5	mg/kg		0.8	0.6	1.0	3.3	0.6
Phenanthrene	85-01-8	0.5	mg/kg		7.3	6.9	4.1	59.0	7.9
Anthracene	120-12-7	0.5	mg/kg		2.0	3.7	1.2	16.0	2.1
Fluoranthene	206-44-0	0.5	mg/kg		7.1	20.2	2.6	65.2	6.8
Pyrene	129-00-0	0.5	mg/kg		6.9	25.2	2.4	69.9	6.9
Benz[a]anthracene	56-55-3	0.5	mg/kg		3.2	14.6	1.0	39.4	3.2
Chrysene	218-01-9	0.5	mg/kg		2.5	12.5	0.8	33.8	2.7
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		3.3	27.0	1.0	36.0	2.9
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		1.2	9.6	<0.5	12.8	1.1
Benzo(a)pyrene	50-32-8	0.5	mg/kg		2.6	24.6	0.8	30.4	2.3
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		0.9	10.8	<0.5	10.0	0.8
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	2.8	<0.5	3.1	<0.5

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16 2.5-2.6	BH17 0.5-0.6	BH17 2.5-2.6	BH18 0.5-0.6	BH18 2.1-2.2
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-017	EM1710504-018	EM1710504-020	EM1710504-021	EM1710504-023
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		1.1	15.1	<0.5	12.0	0.9
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		40.9	178	19.3	407	40.6
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		3.5	33.9	1.0	43.8	3.1
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		3.7	33.9	1.3	43.8	3.4
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		4.0	33.9	1.6	43.8	3.6
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	60	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		120	1920	<100	1470	140
C29 - C36 Fraction	----	100	mg/kg		<100	1750	<100	720	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		120	3730	<50	2190	140
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	140	<50	100	<50
>C16 - C34 Fraction	----	100	mg/kg		160	3120	100	1920	170
>C34 - C40 Fraction	----	100	mg/kg		<100	940	<100	330	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		160	4200	100	2350	170
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	140	<50	100	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	4	1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		105	104	104	112	95.1
2-Chlorophenol-D4	93951-73-6	0.5	%		92.4	91.5	92.0	99.0	83.4
2.4.6-Tribromophenol	118-79-6	0.5	%		92.8	98.6	94.9	106	89.4

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH16 2.5-2.6	BH17 0.5-0.6	BH17 2.5-2.6	BH18 0.5-0.6	BH18 2.1-2.2
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-017	EM1710504-018	EM1710504-020	EM1710504-021	EM1710504-023
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		103	101	98.9	107	90.6
Anthracene-d10	1719-06-8	0.5	%		110	111	108	110	96.7
4-Terphenyl-d14	1718-51-0	0.5	%		114	118	110	124	103
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		76.6	82.1	73.1	77.5	88.1
Toluene-D8	2037-26-5	0.2	%		95.2	106	96.4	98.4	101
4-Bromofluorobenzene	460-00-4	0.2	%		86.2	90.3	85.1	99.8	102

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19 0.5-0.6	BH19 2.5-2.6	BH20 0.5-0.6	BH20 2.5-2.6	BH21 0.5-0.6
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-024	EM1710504-026	EM1710504-027	EM1710504-029	EM1710504-030
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		17.3	14.9	20.1	21.1	15.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		180	40	70	1660	120
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		17	4	4	26	12
Cobalt	7440-48-4	2	mg/kg		13	3	11	22	11
Copper	7440-50-8	5	mg/kg		121	8	50	54	68
Lead	7439-92-1	5	mg/kg		425	10	80	14	249
Manganese	7439-96-5	5	mg/kg		323	120	593	249	376
Nickel	7440-02-0	2	mg/kg		14	4	16	20	15
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		47	22	48	124	45
Zinc	7440-66-6	5	mg/kg		542	5	71	24	237
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		4.3	<0.1	0.1	<0.1	0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		0.6	<0.5	<0.5	<0.5	48.7
Acenaphthylene	208-96-8	0.5	mg/kg		2.5	<0.5	<0.5	<0.5	54.3
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	5.5
Fluorene	86-73-7	0.5	mg/kg		0.6	<0.5	<0.5	<0.5	40.6
Phenanthrene	85-01-8	0.5	mg/kg		9.1	<0.5	1.4	<0.5	232
Anthracene	120-12-7	0.5	mg/kg		3.0	<0.5	0.5	<0.5	202
Fluoranthene	206-44-0	0.5	mg/kg		17.2	0.6	3.6	<0.5	250
Pyrene	129-00-0	0.5	mg/kg		18.7	0.6	4.3	<0.5	247
Benz[a]anthracene	56-55-3	0.5	mg/kg		10.4	<0.5	2.8	<0.5	117
Chrysene	218-01-9	0.5	mg/kg		8.3	<0.5	2.4	<0.5	96.9
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		13.2	<0.5	3.2	<0.5	101
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		3.8	<0.5	1.2	<0.5	41.0
Benzo(a)pyrene	50-32-8	0.5	mg/kg		10.9	<0.5	2.5	<0.5	90.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		3.9	<0.5	0.9	<0.5	28.0
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		1.2	<0.5	<0.5	<0.5	7.9

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19 0.5-0.6	BH19 2.5-2.6	BH20 0.5-0.6	BH20 2.5-2.6	BH21 0.5-0.6
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-024	EM1710504-026	EM1710504-027	EM1710504-029	EM1710504-030
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		4.6	<0.5	1.0	<0.5	32.7
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		108	1.2	23.8	<0.5	1590
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		15.4	<0.5	3.3	<0.5	128
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		15.4	0.6	3.6	0.6	128
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		15.4	1.2	3.8	1.2	128
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	220
C15 - C28 Fraction	----	100	mg/kg		620	<100	130	<100	4130
C29 - C36 Fraction	----	100	mg/kg		330	<100	<100	<100	1740
^ C10 - C36 Fraction (sum)	----	50	mg/kg		950	<50	130	<50	6090
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	460
>C16 - C34 Fraction	----	100	mg/kg		830	<100	190	<100	5120
>C34 - C40 Fraction	----	100	mg/kg		140	<100	<100	<100	810
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		970	<50	190	<50	6390
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	440
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	15
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		98.9	95.0	104	103	95.1
2-Chlorophenol-D4	93951-73-6	0.5	%		96.2	88.1	91.8	91.2	83.9
2.4.6-Tribromophenol	118-79-6	0.5	%		84.6	89.8	90.7	91.9	89.4

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH19 0.5-0.6	BH19 2.5-2.6	BH20 0.5-0.6	BH20 2.5-2.6	BH21 0.5-0.6
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-024	EM1710504-026	EM1710504-027	EM1710504-029	EM1710504-030
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		91.8	97.9	106	103	94.2
Anthracene-d10	1719-06-8	0.5	%		104	108	113	109	108
4-Terphenyl-d14	1718-51-0	0.5	%		102	109	119	113	115
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		76.0	72.6	72.2	81.8	74.6
Toluene-D8	2037-26-5	0.2	%		94.5	89.0	88.2	100	92.5
4-Bromofluorobenzene	460-00-4	0.2	%		88.6	85.5	77.7	91.3	103

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21 2.1-2.2	BH22 0.5	Dup 1	Dup 2	----
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	----
Compound	CAS Number	LOR	Unit		EM1710504-032	EM1710504-033	EM1710504-034	EM1710504-035	----------
					Result	Result	Result	Result	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		23.1	18.2	17.2	9.8	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	----
Barium	7440-39-3	10	mg/kg		80	190	100	30	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg		14	30	9	8	----
Cobalt	7440-48-4	2	mg/kg		14	29	9	13	----
Copper	7440-50-8	5	mg/kg		39	68	19	17	----
Lead	7439-92-1	5	mg/kg		67	<5	76	52	----
Manganese	7439-96-5	5	mg/kg		178	546	168	180	----
Nickel	7440-02-0	2	mg/kg		12	31	8	11	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	----
Vanadium	7440-62-2	5	mg/kg		52	100	32	19	----
Zinc	7440-66-6	5	mg/kg		52	18	25	63	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		1.2	<0.1	0.2	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		4.6	<0.5	0.8	0.9	----
Acenaphthylene	208-96-8	0.5	mg/kg		5.2	<0.5	1.3	1.6	----
Acenaphthene	83-32-9	0.5	mg/kg		0.6	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		4.3	<0.5	1.0	0.6	----
Phenanthrene	85-01-8	0.5	mg/kg		21.2	<0.5	7.1	7.4	----
Anthracene	120-12-7	0.5	mg/kg		19.5	<0.5	2.3	2.0	----
Fluoranthene	206-44-0	0.5	mg/kg		19.4	<0.5	6.4	6.4	----
Pyrene	129-00-0	0.5	mg/kg		19.1	<0.5	6.3	6.5	----
Benz[a]anthracene	56-55-3	0.5	mg/kg		9.0	<0.5	2.8	3.1	----
Chrysene	218-01-9	0.5	mg/kg		7.6	<0.5	2.3	2.6	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		7.9	<0.5	2.6	2.7	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		3.4	<0.5	0.9	1.1	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		7.2	<0.5	1.9	2.0	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		2.1	<0.5	0.6	0.6	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		0.6	<0.5	<0.5	<0.5	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21 2.1-2.2	BH22 0.5	Dup 1	Dup 2	----
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	----
Compound	CAS Number	LOR	Unit		EM1710504-032	EM1710504-033	EM1710504-034	EM1710504-035	--------
					Result	Result	Result	Result	---
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		2.5	<0.5	0.7	0.7	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		134	<0.5	37.0	38.2	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		10.1	<0.5	2.6	2.8	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		10.1	0.6	2.9	3.0	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		10.1	1.2	3.1	3.3	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		340	<100	100	120	----
C29 - C36 Fraction	----	100	mg/kg		140	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		480	<50	100	120	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		410	<100	130	140	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		410	<50	130	140	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg		8	<1	<1	1	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		99.6	102	93.4	99.2	----
2-Chlorophenol-D4	93951-73-6	0.5	%		89.5	91.4	82.5	87.4	----
2.4.6-Tribromophenol	118-79-6	0.5	%		91.5	88.0	82.9	89.4	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH21 2.1-2.2	BH22 0.5	Dup 1	Dup 2	----
				Client sampling date / time	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	----
Compound	CAS Number	LOR	Unit		EM1710504-032	EM1710504-033	EM1710504-034	EM1710504-035	-------
					Result	Result	Result	Result	---
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		99.8	99.9	94.6	96.9	----
Anthracene-d10	1719-06-8	0.5	%		102	110	98.3	103	----
4-Terphenyl-d14	1718-51-0	0.5	%		110	110	104	110	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		62.7	70.6	68.5	79.3	----
Toluene-D8	2037-26-5	0.2	%		78.4	86.4	82.4	91.8	----
4-Bromofluorobenzene	460-00-4	0.2	%		85.1	82.7	78.2	93.9	----

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Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	7116-2	7116-3	7116-4	7116-5	DUP
				Client sampling date / time	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-001	EM1710504-002	EM1710504-003	EM1710504-004	EM1710504-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.003	0.001	0.002	0.001	0.002
Boron	7440-42-8	0.05	mg/L		1.90	0.30	0.28	0.16	0.29
Barium	7440-39-3	0.001	mg/L		0.108	0.115	0.016	0.014	0.015
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L		0.002	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	0.003	0.003	0.003	0.003
Manganese	7439-96-5	0.001	mg/L		0.915	0.141	0.069	0.144	0.069
Nickel	7440-02-0	0.001	mg/L		0.003	0.001	0.001	<0.001	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	0.20	0.12	0.20
Zinc	7440-66-6	0.005	mg/L		<0.005	0.006	<0.005	<0.005	<0.005
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	1.5	7.6	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz[a]anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	1.5	7.6	<0.5

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	7116-2	7116-3	7116-4	7116-5	DUP
				Client sampling date / time	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-001	EM1710504-002	EM1710504-003	EM1710504-004	EM1710504-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		28.0	26.0	27.4	22.6	26.6
2-Chlorophenol-D4	93951-73-6	1.0	%		78.7	76.6	75.0	73.7	67.5
2.4.6-Tribromophenol	118-79-6	1.0	%		87.0	68.7	69.8	80.5	65.7
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		84.7	74.2	77.2	81.0	74.6
Anthracene-d10	1719-06-8	1.0	%		88.0	81.8	79.1	88.4	83.1
4-Terphenyl-d14	1718-51-0	1.0	%		107	85.2	85.0	91.3	86.0

Page : 17 of 19
Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	7116-2	7116-3	7116-4	7116-5	DUP
				Client sampling date / time	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00	07-Aug-2017 00:00
Compound	CAS Number	LOR	Unit		EM1710504-001	EM1710504-002	EM1710504-003	EM1710504-004	EM1710504-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		92.3	92.3	94.5	92.7	93.5
Toluene-D8	2037-26-5	2	%		85.2	85.3	86.4	84.9	85.0
4-Bromofluorobenzene	460-00-4	2	%		98.0	104	102	106	103

Page : 18 of 19
Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Rinsate 2	Trip blank	Rinsate 1	----	----
				Client sampling date / time	07-Aug-2017 00:00	04-Aug-2017 00:00	04-Aug-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EM1710504-006	EM1710504-007	EM1710504-008	----------	----------
					Result	Result	Result	---	---
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	<100	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		96.8	93.8	92.0	----	----
Toluene-D8	2037-26-5	2	%		90.4	86.5	88.0	----	----
4-Bromofluorobenzene	460-00-4	2	%		106	105	104	----	----

Page : 19 of 19
Work Order : EM1710504
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : 2 Collins Street

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	46
2-Chlorophenol-D4	93951-73-6	23	104
2.4.6-Tribromophenol	118-79-6	28	130
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	36	114
Anthracene-d10	1719-06-8	51	119
4-Terphenyl-d14	1718-51-0	49	127
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1602834**	Page	: 1 of 37
Client	: **GEO-ENVIRONMENTAL SOLUTIONS**	Laboratory	: Environmental Division Melbourne
Contact	: DR JOHN PAUL CUMMING	Contact	: Shirley LeCornu
Address	: 86 QUEEN STREET SANDY BAY TASMANIA, AUSTRALIA 7005	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 03 6223 1839	Telephone	: +61-3-8549 9630
Project	: Collins	Date Samples Received	: 17-Mar-2016 09:05
Order number	: ----	Date Analysis Commenced	: 18-Mar-2016
C-O-C number	: ----	Issue Date	: 29-Mar-2016 17:33
Sampler	: AARON PLUMMER		
Site	: ----		
Quote number	: ----		
No. of samples received	: 72		
No. of samples analysed	: 40		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

RIGHT SOLUTIONS | RIGHT PARTNER

Page	: 2 of 37
Work Order	: EM1602834
Client	: GEO-ENVIRONMENTAL SOLUTIONS
Project	: Collins

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.

- EP080: Particular sample (EM-1602834-042) shows minor BTEX results. Confirmed by Qc sample.
- EP080: Particular sample (EM-1602834-068) shows minor BTEXN results. Confirmed by re-analysis.
- EP075(SIM): Surrogate recoveries for sample EM1602834-044 fall outside of published limits as a result of suspected matrix interferences. Surrogate recoveries have been confirmed by re-extraction.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH01 0.4-0.8m	TH01 2.5-2.6m	TH01 4.2-4.5m	TH02 0.4-0.8m	TH03 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-001	EM1602834-003	EM1602834-005	EM1602834-006	EM1602834-007
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		10.6	9.4	18.2	8.3	6.2
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	8	7	<5	<5
Barium	7440-39-3	10	mg/kg		90	90	80	50	20
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		13	31	14	5	4
Cobalt	7440-48-4	2	mg/kg		16	14	11	32	2
Copper	7440-50-8	5	mg/kg		63	57	56	68	7
Lead	7439-92-1	5	mg/kg		83	52	109	67	8
Manganese	7439-96-5	5	mg/kg		274	224	234	142	90
Nickel	7440-02-0	2	mg/kg		15	25	15	11	3
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		47	51	45	38	5
Zinc	7440-66-6	5	mg/kg		100	43	109	181	19
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.2	0.1	0.2	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH01 0.4-0.8m	TH01 2.5-2.6m	TH01 4.2-4.5m	TH02 0.4-0.8m	TH03 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-001	EM1602834-003	EM1602834-005	EM1602834-006	EM1602834-007
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/ 0-2	0.05	mg/kg		----	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		**11.4**	<0.5	**15.5**	**4.3**	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		**19.6**	<0.5	**26.2**	**6.6**	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		**1.9**	<0.5	**2.7**	<1.2	<0.5

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH01 0.4-0.8m	TH01 2.5-2.6m	TH01 4.2-4.5m	TH02 0.4-0.8m	TH03 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-001	EM1602834-003	EM1602834-005	EM1602834-006	EM1602834-007
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		6.2	<0.5	13.7	3.0	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		74.0	2.2	167	44.2	<0.5
Anthracene	120-12-7	0.5	mg/kg		24.9	0.8	39.8	10.8	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		109	2.4	148	51.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		109	2.4	147	49.7	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		61.8	1.3	66.6	22.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		52.1	1.1	54.6	19.0	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		60.6	1.2	60.0	23.4	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		22.2	<0.5	21.3	8.4	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		53.8	1.0	53.3	20.6	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		26.7	0.6	22.2	10.4	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		8.1	<0.5	6.6	3.0	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		34.5	0.8	26.3	14.4	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		676	13.8	871	292	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		79.9	1.3	77.7	30.4	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		79.9	1.6	77.7	30.4	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		79.9	1.9	77.7	30.4	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		80	<50	100	<50	<50
C15 - C28 Fraction	----	100	mg/kg		2630	<100	2270	1270	<100
C29 - C36 Fraction	----	100	mg/kg		1510	<100	920	740	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		4220	<50	3290	2010	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		210	<50	250	120	<50
>C16 - C34 Fraction	----	100	mg/kg		3720	<100	2860	1790	<100
>C34 - C40 Fraction	----	100	mg/kg		690	<100	430	360	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		4620	<50	3540	2270	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		200	<50	240	120	<50
EP080: BTEXN									

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH01 0.4-0.8m	TH01 2.5-2.6m	TH01 4.2-4.5m	TH02 0.4-0.8m	TH03 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-001	EM1602834-003	EM1602834-005	EM1602834-006	EM1602834-007
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		8	<1	5	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		98.2	96.1	102	105	97.4
2-Chlorophenol-D4	93951-73-6	0.5	%		92.1	78.9	92.3	85.8	79.6
2.4.6-Tribromophenol	118-79-6	0.5	%		105	85.5	97.8	77.2	85.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		104	97.6	100	105	95.8
Anthracene-d10	1719-06-8	0.5	%		102	114	97.0	94.0	114
4-Terphenyl-d14	1718-51-0	0.5	%		105	104	97.6	108	103
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		104	94.7	90.3	116	99.1
Toluene-D8	2037-26-5	0.2	%		86.6	87.8	79.2	87.8	96.0
4-Bromofluorobenzene	460-00-4	0.2	%		109	78.5	92.8	109	83.3

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH03 1.5-1.6m	TH03 3.2-3.4m	TH04 0.5-0.6m	TH04 3.5-3.6m	TH05 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-008	EM1602834-010	EM1602834-011	EM1602834-014	EM1602834-016
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		18.8	19.7	12.1	29.0	6.0
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	6	<5
Barium	7440-39-3	10	mg/kg		180	10	110	10	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		6	6	12	8	13
Cobalt	7440-48-4	2	mg/kg		28	2	8	4	16
Copper	7440-50-8	5	mg/kg		35	<5	69	8	65
Lead	7439-92-1	5	mg/kg		9	<5	162	11	5
Manganese	7439-96-5	5	mg/kg		32	46	315	51	769
Nickel	7440-02-0	2	mg/kg		24	4	17	7	25
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		62	15	28	17	53
Zinc	7440-66-6	5	mg/kg		31	12	337	20	40
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.2	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH03 1.5-1.6m	TH03 3.2-3.4m	TH04 0.5-0.6m	TH04 3.5-3.6m	TH05 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-008	EM1602834-010	EM1602834-011	EM1602834-014	EM1602834-016
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		----	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	1.2	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH03 1.5-1.6m	TH03 3.2-3.4m	TH04 0.5-0.6m	TH04 3.5-3.6m	TH05 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-008	EM1602834-010	EM1602834-011	EM1602834-014	EM1602834-016
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	3.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	1.2	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	10.3	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	10.6	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	5.3	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	4.8	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	7.8	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	2.8	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	7.1	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	4.3	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	1.0	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	6.2	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	66.1	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	10.2	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	10.2	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	10.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	250	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	220	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	470	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	410	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	120	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	530	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH03 1.5-1.6m	TH03 3.2-3.4m	TH04 0.5-0.6m	TH04 3.5-3.6m	TH05 0.5-0.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-008	EM1602834-010	EM1602834-011	EM1602834-014	EM1602834-016
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		90.7	97.9	98.9	94.3	95.4
2-Chlorophenol-D4	93951-73-6	0.5	%		82.0	80.6	80.4	77.4	78.8
2.4.6-Tribromophenol	118-79-6	0.5	%		81.3	90.4	90.8	88.5	85.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		91.9	95.6	96.7	92.7	93.4
Anthracene-d10	1719-06-8	0.5	%		114	112	108	109	109
4-Terphenyl-d14	1718-51-0	0.5	%		100.0	102	102	98.6	99.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		93.9	81.3	97.7	90.0	99.1
Toluene-D8	2037-26-5	0.2	%		114	96.6	103	102	111
4-Bromofluorobenzene	460-00-4	0.2	%		86.4	78.0	84.7	79.1	85.1

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH05 2.0-2.1m	TH05 4.5-4.6m	TH06 0.5-0.6m	TH06 2.0-2.1m	TH06 4.5-4.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-019	EM1602834-022	EM1602834-024	EM1602834-025	EM1602834-030
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		7.5	21.0	14.3	9.0	26.6
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		40	80	140	80	<10
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		15	16	27	17	6
Cobalt	7440-48-4	2	mg/kg		14	17	23	13	4
Copper	7440-50-8	5	mg/kg		90	18	65	57	<5
Lead	7439-92-1	5	mg/kg		49	6	<5	28	<5
Manganese	7439-96-5	5	mg/kg		620	159	373	434	46
Nickel	7440-02-0	2	mg/kg		22	12	29	22	4
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		48	94	106	53	18
Zinc	7440-66-6	5	mg/kg		52	14	22	48	9
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH05 2.0-2.1m	TH05 4.5-4.6m	TH06 0.5-0.6m	TH06 2.0-2.1m	TH06 4.5-4.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-019	EM1602834-022	EM1602834-024	EM1602834-025	EM1602834-030
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/ 0-2	0.05	mg/kg	----	----	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg	----	----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	----	----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	----	----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	----	----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	----	----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	----	----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH05 2.0-2.1m	TH05 4.5-4.6m	TH06 0.5-0.6m	TH06 2.0-2.1m	TH06 4.5-4.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-019	EM1602834-022	EM1602834-024	EM1602834-025	EM1602834-030
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	0.7	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	0.8	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	0.6	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	3.1	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	0.6	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.9	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	140	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	140	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	180	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	130	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	310	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TH05 2.0-2.1m	TH05 4.5-4.6m	TH06 0.5-0.6m	TH06 2.0-2.1m	TH06 4.5-4.6m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-019	EM1602834-022	EM1602834-024	EM1602834-025	EM1602834-030
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		95.6	98.6	97.0	93.6	99.2
2-Chlorophenol-D4	93951-73-6	0.5	%		86.0	80.9	79.5	82.3	81.6
2.4.6-Tribromophenol	118-79-6	0.5	%		79.0	84.7	85.0	53.7	89.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		92.0	96.1	95.2	92.1	95.8
Anthracene-d10	1719-06-8	0.5	%		108	118	116	106	117
4-Terphenyl-d14	1718-51-0	0.5	%		99.1	105	103	97.5	105
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		103	97.2	96.0	102	90.1
Toluene-D8	2037-26-5	0.2	%		110	101	106	114	94.2
4-Bromofluorobenzene	460-00-4	0.2	%		84.8	79.5	80.4	84.8	72.2

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH07 0.4-0.5m	BH07 3.3-3.4m	BH08 0.5-0.6m	BH08 2.5-2.6m	BH09 0.4-0.5m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-031	EM1602834-033	EM1602834-035	EM1602834-039	EM1602834-041
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		11.8	25.3	21.9	17.4	18.2
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Barium	7440-39-3	10	mg/kg		120	50	150	280	30
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		3	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		10	11	13	30	21
Cobalt	7440-48-4	2	mg/kg		11	9	24	16	9
Copper	7440-50-8	5	mg/kg		56	22	43	56	18
Lead	7439-92-1	5	mg/kg		404	36	13	<5	7
Manganese	7439-96-5	5	mg/kg		281	102	231	413	57
Nickel	7440-02-0	2	mg/kg		13	9	18	25	10
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		39	44	82	59	72
Zinc	7440-66-6	5	mg/kg		305	28	37	10	13
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.4	0.6	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	----	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH07 0.4-0.5m	BH07 3.3-3.4m	BH08 0.5-0.6m	BH08 2.5-2.6m	BH09 0.4-0.5m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-031	EM1602834-033	EM1602834-035	EM1602834-039	EM1602834-041
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg		----	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		1.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		7.4	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		4.9	<0.5	<0.5	<0.5	<0.5

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Work Order : EM1602834
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH07 0.4-0.5m	BH07 3.3-3.4m	BH08 0.5-0.6m	BH08 2.5-2.6m	BH09 0.4-0.5m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-031	EM1602834-033	EM1602834-035	EM1602834-039	EM1602834-041
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		4.3	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		57.0	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		19.0	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		112	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		112	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		56.4	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		48.2	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		65.1	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		21.4	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		56.6	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		27.1	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		6.7	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		36.1	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		636	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		81.1	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		81.1	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		81.1	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		60	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		2590	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		1610	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		4260	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		170	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		3810	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		740	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		4720	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		170	<50	<50	<50	<50
EP080: BTEXN									

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH07 0.4-0.5m	BH07 3.3-3.4m	BH08 0.5-0.6m	BH08 2.5-2.6m	BH09 0.4-0.5m
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-031	EM1602834-033	EM1602834-035	EM1602834-039	EM1602834-041
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	77.2	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	68.2	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		99.6	96.5	93.0	96.0	98.3
2-Chlorophenol-D4	93951-73-6	0.5	%		87.2	79.2	77.3	79.0	80.8
2.4.6-Tribromophenol	118-79-6	0.5	%		77.5	91.8	78.9	87.2	88.2
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		104	94.1	91.6	93.0	95.0
Anthracene-d10	1719-06-8	0.5	%		99.2	110	115	115	117
4-Terphenyl-d14	1718-51-0	0.5	%		103	100	97.0	102	106
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		104	89.1	87.8	102	95.9
Toluene-D8	2037-26-5	0.2	%		88.6	89.3	84.8	104	99.5
4-Bromofluorobenzene	460-00-4	0.2	%		100	75.0	71.5	84.0	79.6

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH10 0.4-0.5m	BH11 0.4-0.5m	BH11 2.7-2.8m	BH12 0.3-0.4m	BH12 1.5-1.6m
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-042	EM1602834-044	EM1602834-047	EM1602834-048	EM1602834-050
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		11.2	9.7	13.0	13.0	19.5
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	14	<5	<5	<5
Barium	7440-39-3	10	mg/kg		80	130	40	80	120
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	2	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		13	22	8	8	24
Cobalt	7440-48-4	2	mg/kg		11	15	10	11	25
Copper	7440-50-8	5	mg/kg		52	61	76	18	114
Lead	7439-92-1	5	mg/kg		208	196	158	488	46
Manganese	7439-96-5	5	mg/kg		500	352	237	237	502
Nickel	7440-02-0	2	mg/kg		12	34	10	9	22
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		44	25	32	25	110
Zinc	7440-66-6	5	mg/kg		176	566	135	421	383
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.4	3.2	0.1	0.1	0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH10 0.4-0.5m	BH11 0.4-0.5m	BH11 2.7-2.8m	BH12 0.3-0.4m	BH12 1.5-1.6m
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-042	EM1602834-044	EM1602834-047	EM1602834-048	EM1602834-050
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/ 0-2	0.05	mg/kg		----	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		**9.3**	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		**24.8**	**0.7**	**0.5**	**0.6**	**0.5**
Acenaphthene	83-32-9	0.5	mg/kg		**3.2**	<0.5	<0.5	<0.5	<0.5

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Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH10 0.4-0.5m	BH11 0.4-0.5m	BH11 2.7-2.8m	BH12 0.3-0.4m	BH12 1.5-1.6m
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-042	EM1602834-044	EM1602834-047	EM1602834-048	EM1602834-050
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		18.7	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		155	2.9	2.5	2.4	1.8
Anthracene	120-12-7	0.5	mg/kg		44.3	0.9	0.9	0.7	0.6
Fluoranthene	206-44-0	0.5	mg/kg		178	6.8	6.1	4.6	4.2
Pyrene	129-00-0	0.5	mg/kg		181	7.6	6.4	4.7	4.6
Benz(a)anthracene	56-55-3	0.5	mg/kg		87.9	4.3	3.5	2.8	2.5
Chrysene	218-01-9	0.5	mg/kg		75.2	4.3	3.3	2.6	2.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		86.5	5.2	4.0	2.9	3.1
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		30.0	1.9	1.5	1.2	1.1
Benzo(a)pyrene	50-32-8	0.5	mg/kg		80.8	4.4	3.6	2.5	2.7
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		35.9	2.3	1.6	1.2	1.3
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		10.3	0.6	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		46.3	2.9	2.0	1.4	1.6
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		1070	44.8	35.9	27.6	26.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		116	6.4	4.7	3.4	3.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		116	6.4	5.0	3.6	3.8
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		116	6.4	5.2	3.8	4.0
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		70	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		2390	260	<100	260	<100
C29 - C36 Fraction	----	100	mg/kg		1110	130	<100	120	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		3570	390	<50	380	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		190	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		3200	360	120	340	110
>C34 - C40 Fraction	----	100	mg/kg		480	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		3870	360	120	340	110
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		190	<50	<50	<50	<50
EP080: BTEXN									

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Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH10 0.4-0.5m	BH11 0.4-0.5m	BH11 2.7-2.8m	BH12 0.3-0.4m	BH12 1.5-1.6m
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-042	EM1602834-044	EM1602834-047	EM1602834-048	EM1602834-050
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		104	76.4	90.8	83.6	88.9
2-Chlorophenol-D4	93951-73-6	0.5	%		91.2	27.7	91.1	83.0	87.7
2.4.6-Tribromophenol	118-79-6	0.5	%		99.2	10.8	64.0	45.3	67.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		102	97.0	102	88.1	101
Anthracene-d10	1719-06-8	0.5	%		95.2	129	115	109	117
4-Terphenyl-d14	1718-51-0	0.5	%		106	117	108	104	110
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		108	103	120	110	92.5
Toluene-D8	2037-26-5	0.2	%		85.8	81.6	98.4	87.4	69.1
4-Bromofluorobenzene	460-00-4	0.2	%		99.2	92.6	109	92.9	84.3

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Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12 2.9-3.0m	BH13 0.3-0.4m	BH13 1.0-1.1m	DUP 3	Duplicate
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-052	EM1602834-053	EM1602834-056	EM1602834-057	EM1602834-058
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		25.2	11.3	12.9	7.9	23.9
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	<5	<5	5	8
Barium	7440-39-3	10	mg/kg		480	120	130	10	10
Beryllium	7440-41-7	1	mg/kg		1	1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		16	13	12	11	8
Cobalt	7440-48-4	2	mg/kg		44	16	10	8	4
Copper	7440-50-8	5	mg/kg		43	13	16	7	7
Lead	7439-92-1	5	mg/kg		24	45	69	7	8
Manganese	7439-96-5	5	mg/kg		200	342	189	358	58
Nickel	7440-02-0	2	mg/kg		52	12	9	11	6
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		72	20	48	21	21
Zinc	7440-66-6	5	mg/kg		45	66	50	46	17
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.2	<0.1	0.3	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----

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Work Order : EM1602834
Client : GEO-ENVIRONMENTAL SOLUTIONS
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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12 2.9-3.0m	BH13 0.3-0.4m	BH13 1.0-1.1m	DUP 3	Duplicate
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-052	EM1602834-053	EM1602834-056	EM1602834-057	EM1602834-058
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/ 0-2	0.05	mg/kg		----	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		1.2	<0.5	<0.5	<0.5	<0.5

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12 2.9-3.0m	BH13 0.3-0.4m	BH13 1.0-1.1m	DUP 3	Duplicate
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-052	EM1602834-053	EM1602834-056	EM1602834-057	EM1602834-058
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		1.0	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		4.2	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		2.3	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		3.8	0.7	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		3.9	0.7	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		1.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		1.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		1.3	0.6	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		1.2	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		0.6	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		22.5	2.0	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		1.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		1.8	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		2.1	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									

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Project : Collins

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH12 2.9-3.0m	BH13 0.3-0.4m	BH13 1.0-1.1m	DUP 3	Duplicate
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-052	EM1602834-053	EM1602834-056	EM1602834-057	EM1602834-058
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		87.5	88.3	83.2	83.8	85.5
2-Chlorophenol-D4	93951-73-6	0.5	%		87.2	88.0	85.8	86.1	93.9
2.4.6-Tribromophenol	118-79-6	0.5	%		63.5	68.2	76.2	91.6	97.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		98.0	91.9	92.8	94.0	117
Anthracene-d10	1719-06-8	0.5	%		109	120	108	106	108
4-Terphenyl-d14	1718-51-0	0.5	%		105	107	116	116	131
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		76.9	116	112	122	98.2
Toluene-D8	2037-26-5	0.2	%		79.3	85.8	90.9	95.9	76.1
4-Bromofluorobenzene	460-00-4	0.2	%		87.5	65.3	100	107	84.4

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Duplicate 2	BH10 2.1-2.2m	BH10 3.4-3.5m	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	----	----
Compound	CAS Number	LOR	Unit		EM1602834-059	EM1602834-068	EM1602834-069	--------	--------
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		20.0	16.6	28.4	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	----	----
Barium	7440-39-3	10	mg/kg		30	30	60	----	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	----	----
Boron	7440-42-8	50	mg/kg		<50	<50	<50	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		8	22	15	----	----
Cobalt	7440-48-4	2	mg/kg		5	15	10	----	----
Copper	7440-50-8	5	mg/kg		8	27	36	----	----
Lead	7439-92-1	5	mg/kg		6	18	79	----	----
Manganese	7439-96-5	5	mg/kg		150	147	175	----	----
Nickel	7440-02-0	2	mg/kg		6	16	10	----	----
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	----	----
Vanadium	7440-62-2	5	mg/kg		25	102	51	----	----
Zinc	7440-66-6	5	mg/kg		16	28	73	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	0.1	0.6	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Duplicate 2	BH10 2.1-2.2m	BH10 3.4-3.5m	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	----	----
Compound	CAS Number	LOR	Unit		EM1602834-059	EM1602834-068	EM1602834-069	********	********
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/ 0-2	0.05	mg/kg		----	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	**6.6**	**310**	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	**3.8**	**76.1**	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	**9.1**	----	----

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Duplicate 2	BH10 2.1-2.2m	BH10 3.4-3.5m	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	----	----
Compound	CAS Number	LOR	Unit		EM1602834-059	EM1602834-068	EM1602834-069	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		<0.5	3.2	67.1	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	9.0	219	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	3.6	65.2	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	7.0	170	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	6.2	148	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	2.2	40.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	1.9	34.2	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	1.8	46.9	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	1.2	19.9	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	1.9	38.9	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	0.8	21.0	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	4.9	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	1.0	24.7	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	50.2	1300	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	2.5	57.2	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	2.8	57.2	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	3.0	57.2	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	24	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	570	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	2090	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	580	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	3240	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	29	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	12	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	800	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	2290	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	170	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	3260	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	260	----	----
EP080: BTEXN									

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Duplicate 2	BH10 2.1-2.2m	BH10 3.4-3.5m	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	----	----
Compound	CAS Number	LOR	Unit		EM1602834-059	EM1602834-068	EM1602834-069	--------	--------
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	2.6	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	4.4	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	6.9	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	2.8	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	16.7	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	9.7	----	----
Naphthalene	91-20-3	1	mg/kg		<1	4	536	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		80.2	81.6	91.9	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		80.2	84.7	92.8	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		80.0	91.4	104	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		94.1	120	128	----	----
Anthracene-d10	1719-06-8	0.5	%		104	104	108	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		113	103	119	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		107	95.8	106	----	----
Toluene-D8	2037-26-5	0.2	%		83.8	95.7	89.2	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		93.8	102	96.6	----	----

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Client : GEO-ENVIRONMENTAL SOLUTIONS
Project : Collins

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	7116-01	7116-02	7116-04	7116-05	duplicate
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-060	EM1602834-061	EM1602834-062	EM1602834-063	EM1602834-064
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.016**	**0.003**	**0.003**	**0.002**	**0.003**
Boron	7440-42-8	0.05	mg/L		**0.32**	**2.20**	**0.40**	**0.18**	**0.37**
Barium	7440-39-3	0.001	mg/L		**0.038**	**0.085**	**0.046**	**0.004**	**0.039**
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L		<0.001	**0.001**	**0.001**	<0.001	**0.001**
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	**0.002**	**0.005**	**0.003**	**0.005**
Manganese	7439-96-5	0.001	mg/L		**1.70**	**0.391**	**0.123**	**0.049**	**0.128**
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.002**	**0.003**	<0.001	**0.002**
Lead	7439-92-1	0.001	mg/L		<0.001	**0.003**	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	**0.15**	**0.14**	**0.16**
Zinc	7440-66-6	0.005	mg/L		**0.012**	<0.005	**0.005**	<0.005	<0.005
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1	µg/L		<1.0	**2.5**	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1	µg/L		<1.0	**1.6**	<1.0	<1.0	<1.0
Anthracene	120-12-7	1	µg/L		<1.0	**1.2**	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1	µg/L		<1.0	**4.2**	<1.0	<1.0	<1.0
Pyrene	129-00-0	1	µg/L		<1.0	**4.5**	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	**1.9**	<1.0	<1.0	<1.0
Chrysene	218-01-9	1	µg/L		<1.0	**1.8**	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	**2.1**	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	**2.0**	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	**1.3**	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	**23.1**	<0.5	<0.5	<0.5

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Project : Collins

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	7116-01	7116-02	7116-04	7116-05	duplicate
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-060	EM1602834-061	EM1602834-062	EM1602834-063	EM1602834-064
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	2.4	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	130	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	130	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<100	160	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	160	<100	<100	<100
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	<100	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		20.3	38.0	38.4	21.8	28.6
2-Chlorophenol-D4	93951-73-6	1	%		52.3	81.5	87.8	56.3	74.4
2.4.6-Tribromophenol	118-79-6	1	%		48.1	80.4	84.0	53.5	71.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		53.6	94.8	91.3	58.1	83.2
Anthracene-d10	1719-06-8	1	%		59.0	97.2	95.2	67.2	83.6
4-Terphenyl-d14	1718-51-0	1	%		58.0	100	94.4	68.0	83.4

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Project	: Collins

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	7116-01	7116-02	7116-04	7116-05	duplicate
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]	[15-Mar-2016]
Compound	CAS Number	LOR	Unit		EM1602834-060	EM1602834-061	EM1602834-062	EM1602834-063	EM1602834-064
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		102	109	106	98.4	98.9
Toluene-D8	2037-26-5	2	%		100	101	102	95.4	97.3
4-Bromofluorobenzene	460-00-4	2	%		97.4	98.3	98.2	93.4	96.0

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Project : Collins

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	rinsate 1	rinsate 2	----	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	----	----	----
Compound	CAS Number	LOR	Unit		EM1602834-065	EM1602834-066	--------	--------	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		----	----	----	----	----
Boron	7440-42-8	0.05	mg/L		----	----	----	----	----
Barium	7440-39-3	0.001	mg/L		----	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L		----	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L		----	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		----	----	----	----	----
Copper	7440-50-8	0.001	mg/L		----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		----	----	----	----	----
Lead	7439-92-1	0.001	mg/L		----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		----	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L		----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		----	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1	µg/L		<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1	µg/L		<1.0	<1.0	----	----	----
Fluorene	86-73-7	1	µg/L		<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1	µg/L		<1.0	<1.0	----	----	----
Anthracene	120-12-7	1	µg/L		<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1	µg/L		<1.0	<1.0	----	----	----
Pyrene	129-00-0	1	µg/L		<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L		<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L		<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L		<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L		<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	----	----	----

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	rinsate 1	rinsate 2	----	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	----	----	----
Compound	CAS Number	LOR	Unit		EM1602834-065	EM1602834-066	--------	--------	--------
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	----
Toluene	108-88-3	2	µg/L		<2	<2	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		34.3	29.3	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		93.4	76.5	----	----	----
2.4.6-Tribromophenol	118-79-6	1	%		88.5	63.4	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		102	75.5	----	----	----
Anthracene-d10	1719-06-8	1	%		102	79.0	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		103	74.1	----	----	----

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	rinsate 1	rinsate 2	----	----	----
				Client sampling date / time	[15-Mar-2016]	[15-Mar-2016]	----	----	----
Compound	CAS Number	LOR	Unit		EM1602834-065	EM1602834-066	--------	--------	--------
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		96.5	101	----	----	----
Toluene-D8	2037-26-5	2	%		95.0	99.2	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		93.1	97.4	----	----	----

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Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	46
2-Chlorophenol-D4	93951-73-6	23	104
2.4.6-Tribromophenol	118-79-6	28	130
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	36	114
Anthracene-d10	1719-06-8	51	119
4-Terphenyl-d14	1718-51-0	49	127
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

praxisenvironment

heritage

planning

archaeology

po box 338
north hobart
tasmania 7002

0418 303 184
info@prax.com.au

Statement of Archaeological Potential

Archaeological Impact Assessment & Method Statement

2 Collins Street

HOBART TASMANIA

Brad Williams

Historical Archaeologist

For Fragrance Tas-Hobart (Collins) Pty. Ltd.

August 2016

Based on Statement of Archaeological Potential undertaken for

Fairbrother Pty. Ltd.

October 2014

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This document was written by Brad Williams (BA.Hons Archaeology, G.Dip Maritime Archaeology, MA Cultural Heritage Management) Historical Archaeologist, Heritage Consultant and Director of Praxis Environment.

Unless otherwise stated, all photographs were taken by Brad Williams, September 2014

Unless otherwise stated, the north point (or approximate) of maps and plans is to the top of the page.

Cadastral information depicted in this document must not be relied upon without verification by a Surveyor.

Document control	Date	Cleared
Preliminary draft provided	151014	Brad Williams
Revised (Fragrance)	080916	Brad Williams
Client signoff on draft		
Final provided		

Executive summary

This document was originally commissioned by Fairbrother Pty. Ltd. in order to accompany an application to the Hobart City Council for the redevelopment of 2 Collins Street, Hobart. The statement of historical archaeological potential was developed in 2014 as the first stage of managing historical archaeology in that project.

The brief for this project was:

- To develop a **statement of archaeological potential** (SoHAP) as the basis for archaeological planning.
- To undertake an **archaeological impact assessment** for the proposed development as informed by the statement of archaeological potential.
- If necessary, refine the statement of potential and formulate **mitigation strategies** for any identified impact.

That project did not progress to an archaeological impact assessment nor archaeological method statement, as the proposed development did not go ahead. The site was onsold to Fragrance Tas-Hobart (Collins) Pty. Ltd. Who commissioned Praxis Environment to review the previous SoHAP then progress the archaeological impact assessment and archaeological method statement to take a new proposal to development application stage (i.e. complete the above brief).

Consistent with the process advocated by the ICOMOS Australia *Burra Charter*, conservation planning process as accepted by the Australian heritage industry and the specific provisions of the various statutory heritage planning/permit authorities, this document has:

- Provided an overview history of the development of the subject site and the precinct in which it is situated and a context within which to understand its archaeological potential and significance.
- Developed policy by which future development of the site can be guided (archaeological policy).
- Assessed the impact of a particular proposed development upon archaeological significance.
- Formulated mitigation strategies to manage any likely heritage impacts arising from that development.

This report has concluded that:

A large part of the site has high potential to yield archaeological remains and information on a range of early cultural activity, including:

- The c1822 government slaughterhouse (the first official meat processing facility in Hobart Town).
- Residential development dating to as early as the 1810s (at least 7 individual houses – some substantial).
- Industry, including woolstapling and fellmongery dating back to the 1820s (and an operation which ran for almost a century).

A portion of the site has low archaeological potential, being the former course of the Park Street/Domain Rivulet which is likely to have been subject to extensive disturbance.

The site generally appears to have been subject to little disturbance, with twentieth-century development being largely on top of (and including) substantial fill to raise the general ground level. This is likely to have encapsulated and protected earlier archaeological remains. The place has the potential to add a greater depth of knowledge on the Wapping area, with a considerable amount of archaeological work having already been undertaken in the area. A series of research questions have been posed for the site, which demonstrates its potential to add knowledge to key historic themes of importance to Tasmania (and beyond). Accordingly, the following archaeological zoning plan and summary is proposed:

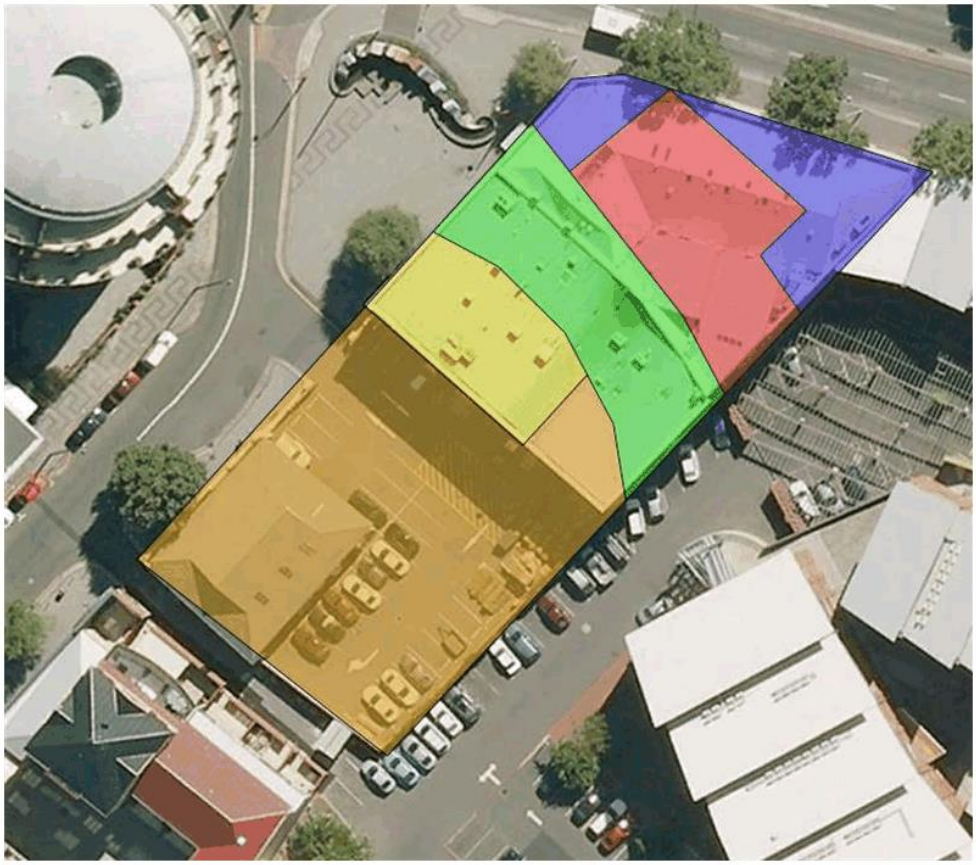

Figure ES.1 – Archaeological zoning plan, 2 Collins Street (adapted from GoogleEarth).

Area	Likely remains	Likely integrity	Significance/potential
Blue	Domestic discard, underfloor deposits, structure, drains, paving etc. associated with post 1858 housing and 100 years of occupancy.	Likely to be reasonably intact, the only disturbance event being the demolition of those buildings and the c1958 construction of the current Roberts building. The building being largely laid out as a 'clear span' building and the likely filling of the site to build up the level is likely to have preserved remains.	Of some archaeological interest in demonstrating the evolution of the site and how the 'higher class' fringe of Wapping developed alongside the reinvigoration of the area resulting from the nearby railway station. Nonetheless, remains of 1870s+ buildings and occupational debris are not considered to be of the highest significance. Whilst it is likely that there are remains of these buildings and occupation deposits in this area, with the low level of significance of these remains it is concluded that these are of **low archaeological potential.** Note that as per below, deeper deposits in this area are likely to be of high archaeological potential.
	Possible ancillary structures and artifacts relating to the government slaughterhouse.	Unknown. The exact nature of any ancillary infrastructures relating to the slaughterhouse is unclear. It is also not known how thoroughly the site was demolished/cleansed prior to the post-1860 construction of the residences in this location. It is likely that the level of the site was built up following the demolition of the slaughterhouse and prior to construction of the residences which would act to preserve earlier archaeological remains.	Of high significance as Hobart's first large-scale meat processing facility and the government's attempt to regulate the meat industry. Until a more adequate knowledge is gained as to the integrity of any slaughterhouse remains, these remains must be considered to be of **high archaeological potential**.
Red	Domestic discard, underfloor deposits, structure, drains, paving etc. associated with post 1870 housing and ~80 years of occupancy.	Likely to be reasonably intact, the only disturbance event being the demolition of those buildings and the c1958 construction of the current Roberts building. The building being largely laid out as a 'clear span' building and the likely filling of the site to build up the level is likely to have preserved remains.	Of some archaeological interest in demonstrating the evolution of the site and how the 'higher class' fringe of Wapping developed alongside the reinvigoration of the area resulting from the nearby railway station. Nonetheless, remains of 1870s+ buildings and occupational debris are not considered to be of the

			highest significance. Whilst it is likely that there are remains of these buildings and occupation deposits in this area, with the low level of significance of these remains it is concluded that these are of **low archaeological potential.** Note that as per below, deeper deposits in this area are likely to be of high archaeological potential.
	Structure, artifacts and ancillary infrastructure relating to the actual footprint of the government slaughterhouse.	Unknown. The exact nature of the slaughterhouse is not known, although depicted as a masonry building. It is also not known how thoroughly the site was demolished/cleansed prior to the post-1870s construction of the residences in this location. It is likely that the level of the site was built up following the demolition of the slaughterhouse and prior to construction of the residences which would act to preserve earlier archaeological remains.	Of high significance as Hobart's first large-scale meat processing facility and the government's attempt to regulate the meat industry. Until a more adequate knowledge is gained as to the integrity of any slaughterhouse remains, these remains must be considered to be of **high archaeological potential**.
Green	Fill from the filling of the rivulet following drainage works c1916-25. Remains of infrastructure used to control the Domain/Park Street Rivulet (e.g. walls, channels etc.). Remains of the natural rivulet bed.	It is unclear what methods were used to fill the rivulet and how thoroughly any associated infrastructure was demolished. At least two sewer mains are shown on the 1936 plans for the Roberts building which would have impacted the integrity of this part of the site. The foundations of the Roberts building were substantial (probably necessitated by the less stable rivulet bed) which would have further impacted upon any archaeological remains.	Whilst there may be some artifacts (discard/fill) and ancillary structures of archaeological interest and/or relating to other themes across the site/area in this area, and insights into filling methods may be of some value for understanding site formation processes across the site, this area is likely to have been highly disturbed and of low significance in any case. Overall, this area is considered to have **low archaeological potential.**

Yellow	Area where there appears to have been little/no historical development (i.e. yard space).		Although there were no known buildings in this area, proximity to such an intensively utilised area means that there may be significant artifacts (discard/fill) and ancillary structures of archaeological interest and/or relating to other themes across the site/area. There is also the possibility that this area may have remains of undocumented buildings. Overall, this area is considered to have **medium archaeological potential.**
Orange	Remains of early residential development (pre-c.1819) and the woolstapling and fellmonger businesses.	These remains are likely to be largely intact, with only a single phase of development occurring post their demolition (c1925) and a high likelihood that extensive filling of the site was undertaken post-demolition of the earlier buildings. That development pre-dates mechanical excavation and the large and relatively open nature of that building, coupled with filling to level the site and bring it to the new street level is likely to have had minimal archaeological impact and acted to preserve underlying remains.	Of high significance as representing an early area of residential development in the Wapping (and general city fringe) area. Also of high significance as an early and long-running colonial industry. Overall, this area is considered to have **high archaeological potential.**

A proposal has been formulated which seeks to construct a substantial mixed-use development on the site, which will result in 100% site coverage. Excavations required for the proposed development are limited to shallow clearance of recent structures, paving (etc.) across the entire site and a series of piles to bedrock in a grid pattern across the site. The archaeological impact assessment (Section 4) considers the impact of those works upon the identified archaeological values of the site.

Given that significant archaeological remains are likely to be deeply buried by more recent and non-significant fill, the clearance of the site to a shallow depth is not considered likely to have any archaeological impact (i.e. the clearance will not extend to the depth of significant archaeological remains). Also, given that piling offers no opportunity to undertake archaeological investigations in the works process and technically only disturbs a small percentage of the site, the archaeological method statement (Section 5) proposes an extensive **archaeological test trenching program** which seeks to yield a range of archaeological data from the site prior to the proposed development obscuring the future ability to undertake such works and essentially encapsulating the archaeological resource beneath the building.

1. Introduction

This document was originally commissioned by Fairbrother Pty. Ltd. in order to accompany an application to the Hobart City Council for the redevelopment of 2 Collins Street, Hobart. The statement of historical archaeological potential was developed in 2014 as the first stage of managing historical archaeology in that project.

The brief for that project was:

- To develop a **statement of archaeological potential** (SoHAP) as the basis for archaeological planning.
- To undertake an **archaeological impact assessment** for the proposed development as informed by the statement of archaeological potential.
- If necessary, refine the statement of potential and formulate **mitigation strategies** for any identified impact.

That project did not progress to an archaeological impact assessment nor archaeological method statement, as the proposed development did not go ahead. The site was onsold to Fragrance Tas-Hobart (Collins) Pty. Ltd. Who commissioned Praxis Environment to review the previous SoHAP then progress the archaeological impact assessment and archaeological method statement to take a new proposal to development application stage (i.e. complete the above brief).

The site currently comprises of a c1958 store, warehouse and office building (formerly Roberts), a large open former workshop and façade (formerly a garage) and a ground-level carpark area. Figures 1.1-1.2 depict the area which is subject to the proposed works, which comprises the *subject site,* a portion of a 3009 square metre site comprising of Certificate of Title 121603/1, on the north-eastern fringe of the Hobart CBD.

Although the buildings on the site are not included in any statutory heritage list, the place is listed as a place of Archaeological Sensitivity (ref. 7) on Schedule 1 (Table 2) of the *Sullivans Cove Planning Scheme 1997* (the *scheme*); therefore Schedule 22.6 of the scheme (archaeological requirements) is applicable. Accordingly, the brief for this project was:

- To develop a **statement of archaeological potential** as the basis for archaeological planning.
- To undertake an **archaeological impact assessment** for the proposed development as informed by the statement of archaeological potential.

- If necessary, refine the statement of potential and formulate **mitigation strategies** for any identified impact via an **archaeological method statement.**

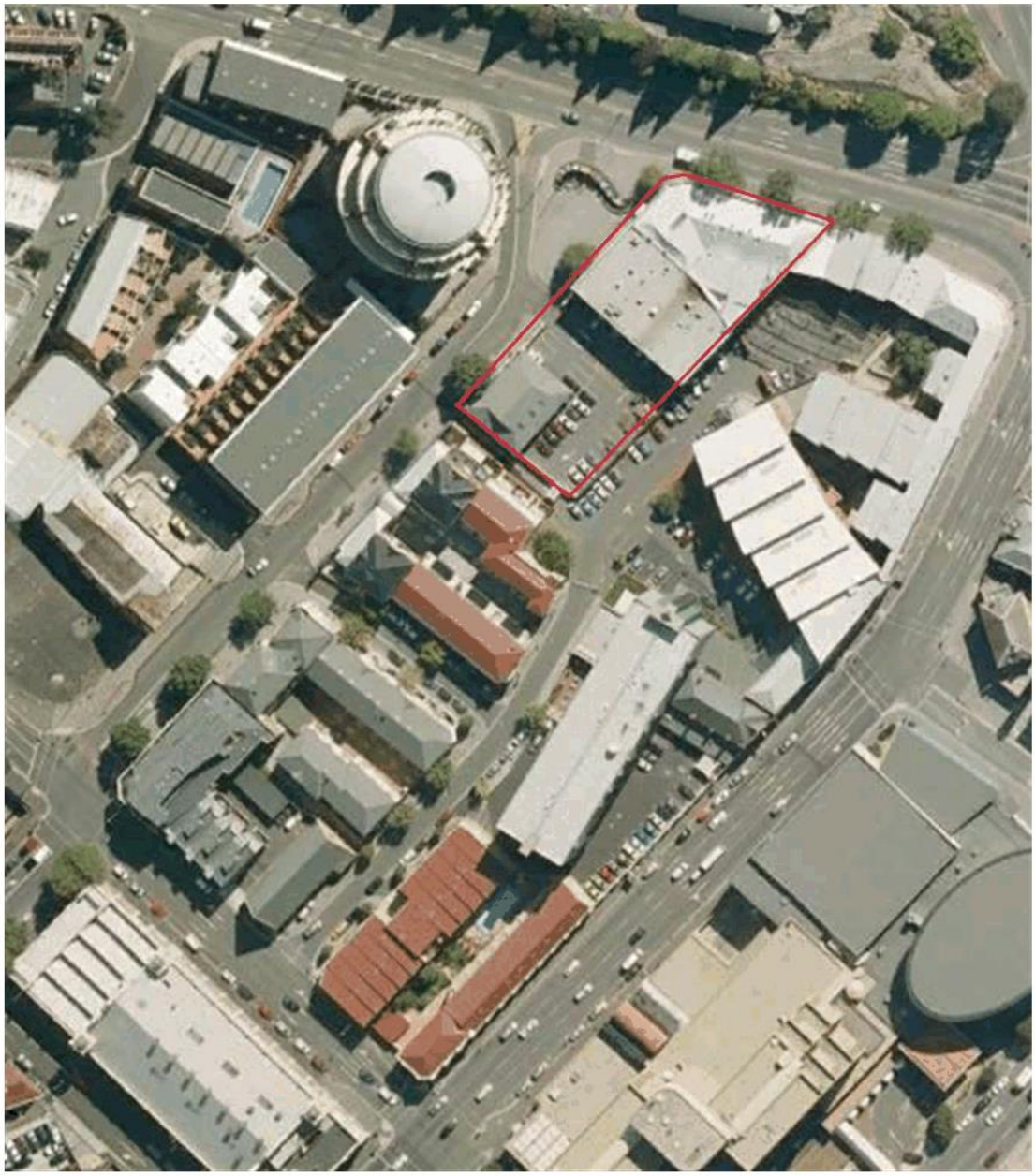

Figure 1.1 - 2008 Aerial image of the area – the subject site depicted in red. GoogleEarth.

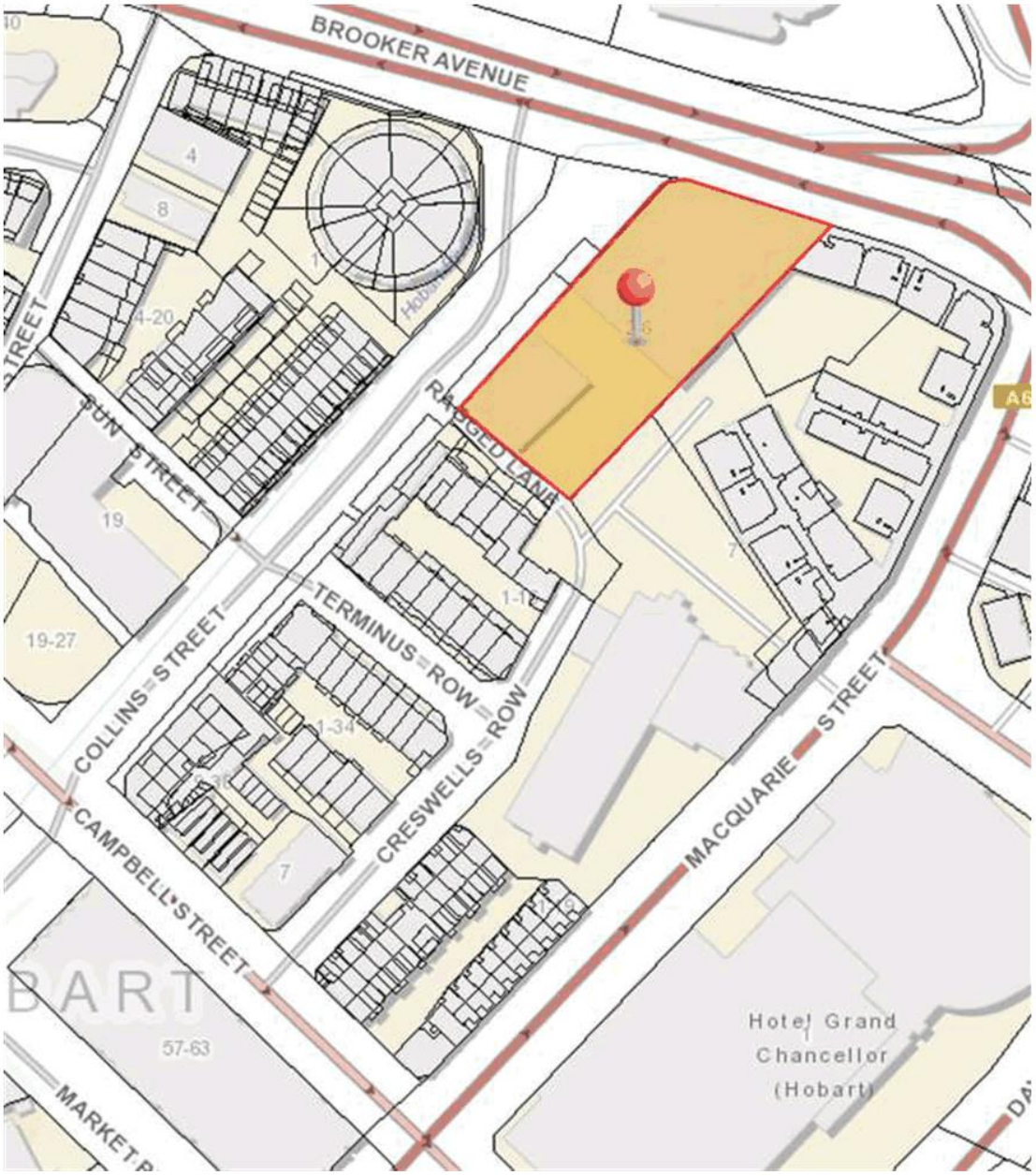

Figure 1.2 – Cadastral parcels comprising the subject site (depicted in red) and surrounds (www.thelist.tas.gov.au).

Whilst the place is not listed on the Tasmanian Heritage Register, the archaeological approach in this document has been developed with regard to the Tasmanian Heritage Council's Practice Note 2 – *Managing*

Historical Archaeological Significance in the Works Application Process[1], and the Tasmanian Heritage Council's *Guidelines for Historical Archaeological Research on Registered Places*[2] as a means of demonstrating a sound and best-practice approach.

A proposal has been formulated which proposes a large mixed-use development which will provide 100% site coverage. That development does not propose mass excavation, beyond shallow clearing of the entire site and a series of piles to bedrock across the site. The archaeological impact assessment and archaeological method statement will consider the methodology required for the foundations of the proposed building and formulate a series of strategies to manage historical archaeology in-line with these statutory requirements.

[1] http://www.heritage.tas.gov.au/media/pdf/2%20Practice%20note%20-%20Archaeology.pdf

[2] http://www.heritage.tas.gov.au/media/pdf/Archae%20ResGlines%20%20FINAL%20-%20June%202009.pdf

2. Statutory heritage requirements

This report has been commissioned to consider the historical archaeological potential of the subject site arising from any applicable statutory listings. The following statutory heritage responsibilities that relate to historical archaeology are to be met in any development of the subject site:

Sullivans Cove Planning Scheme 1997

The place is listed as a place of Archaeological Sensitivity (ref. 7) on Schedule 1 (Table 2) of the *Sullivans Cove planning Scheme 1997* (the *scheme*); therefore Schedule 22.6 of the scheme (archaeological requirements) is applicable.

Figure 1.3 – Excerpt from Figure 5a of the SCPS1997 showing the subject site (ref.7) and in relation to other areas of archaeological potential (pink).

Accordingly, any submission for development of a place of archaeological sensitivity requires either:

- An Archaeological Sensitivity Report;

or

- A statement by a qualified archaeologist that either the site has been surveyed previously and found not to be of archaeological significance or that the nature of the 'building or works' will not result in destruction of any aspects items of archaeological significance.

And if significant archaeological remains are predicted, then the authority will have regard to:

- The likelihood of the proposed 'building or works' resulting in the removal or destruction of items of archaeological significance.
- The cultural significance of the site.
- Evidence of an adequate archaeological reconnaissance and site sampling prior to the approval or carrying out of works.
- The need to reasonably protect potential archaeological significance during the design, and carrying out of works.
- The need to undertake an archaeological 'watching brief' to be required during the carrying out of works.

Tasmanian Heritage Register

The subject site is not listed on the Tasmanian Heritage Register, therefore is not subject to the provisions of the *Historic Cultural Heritage Act 1995.*

Other statutory heritage registers/lists

The subject site is not listed on any of the following statutory registers:

- The National Heritage List
- The Commonwealth Heritage List
- The World Heritage List

Nor is it included in any buffer zones arising from those lists. Therefore is not subject to the historic heritage provisions of the respective Acts which enable statutory input into development of places on those lists.

Aboriginal Relics Act 1975

An assessment of any possible Aboriginal heritage values is not part of the brief for this report; nonetheless the provisions of the *Aboriginal Relics Act 1975* are applicable to the place.

3. Statement of Historical Archaeological Potential

3.1. Archaeological methodology

This statement of archaeological potential is derived from a process which identifies the potential of the site to yield archaeological remains, the significance of any remains, and their potential to yield meaningful information about the site, and which might contribute to relevant key archaeological and historical themes. The following briefly outlines the methodology followed:

Determining general archaeological potential: Through a desktop analysis of historical data and secondary sources, as well as non-invasive site observations, an understanding of the evolution of the site has been gained which has allowed an assessment of the archaeological potential (however significant) of any part of the site - resulting in substantiated predictions of the likelihood of finding *something* upon any particular part of the site.

This has been done by analysing primary source material, summarizing the developmental history of the site and developing a chronological narrative detailing an overview of the history of all known features to have ever existed on the site. Where possible, developmental overlays have been developed from historic maps, plans, photographs and other visual documentation. This overlay has been supported by other observations providing supplementary information, and also includes processes such as demolition and disturbance which may have removed or destroyed potential remains – and may have diminished the archaeological potential.

Assessing the significance and potential of any likely archaeological resources to yield meaningful information**:** Upon understanding the archaeological potential through desktop and site analysis, the next step was to understand its relationship to any aspect of the identified significance of the place – e.g. do the remains have the potential to demonstrate an aspect of the significance of the site or related key historic theme? The potential for any of the archaeological remains to demonstrate important aspects of the history of the site, whether in a state, regional or thematic context, is to be considered.

Understanding possible impact of development and formulation of management strategies**:** Based on any identified archaeological potential and significance of the site, consideration will be given as to whether the proposed development will impact upon any likely archaeological remains and if necessary broad management strategies will be proposed to manage any impact.

Table 1 (below) demonstrates the steps of this assessment:

Methodology for formulation of the statement of archaeological potential		
	If 'no'	**If 'yes'**
1. Archaeological potential. Are you likely to find something if you dig here? (i.e. a Statement of Archaeological Potential).	Further action may not be required, although a contingency plan may be required for unexpected finds.	The significance of the archaeological potential should be investigated.
2. Significance. Could anything you find here greatly contribute to our understanding of the site or related significant theme?	Further action may not be required.	The likely integrity of the archaeological remains should be investigated.
3. Integrity. Are any archaeological remains likely to be intact?	Further action may not be required, although a contingency plan is required for unexpected integrity.	The likelihood of significant archaeological remains is confirmed.
4. Impact Will proposed works impact upon the significant archaeological remains? i.e. an Archaeological Impact Assessment.	Further action may not be required, although a contingency plan may be required for unexpected impacts.	An Archaeological Method Statement will be required to detail how impact will be managed/mitigated.

3.2. Source material

For this initial assessment of archaeological potential, the depiction of the physical history of the site will be the main consideration – with other aspects of site history (i.e. social histories, economic history, associations *et. al.*) likely to be more useful in any post-investigation analysis of findings (i.e. artifact assessment), therefore beyond the scope of the current document. Similarly, the history of other townscape developments is beyond the scope of the current document however may be useful in further detailed analysis of future archaeological findings.

The following overview of the known physical development history of the site aims to aid in the prediction of the likely archaeological remains. This does not represent a comprehensive site history, and has been limited to a history of the physical development of the site as relevant to the archaeological resource.

Primary sources

Broadly, the primary sources consulted in the development of the statement of archaeological potential include:

- Hobart City Council building files (AE471 series, Tasmanian Archive and Heritage Office).
- Historic maps, photographs (NS and PH series) - Tasmanian Archive and Heritage Office.
- Department of Primary Industry, Parks, Water and Environment (DPIPWE) aerial photo collection (Service Tasmania).
- DPIPWE – Land Data Branch, historic map collection (basement)
- DPIPWE – Land Data Branch, titles.
- Historic newspapers, via the National Library of Australia's *Newspapers Online* portal.
- Valuation rolls, as published in the Hobart Town Gazette.

Secondary sources

Several secondary sources were consulted in order to gain an overview of the history of the Wapping area generally, and a review of previous archaeological work in the area (further discussed below). These include (held by the State Library of Tasmania/heritage Tasmania):

A History of the Roberts Limited Site
Lindy Scripps (unpublished report), 1994.

Down Wapping. Hobart's Vanished Wapping and Old Wharf Districts
Wapping History Group. Blubber Head Press, 1998.

Wapping, A New Place to Live.
Wapping Implementation Project. Site Histories.
Tony Rayner, May 1995

Archaeological and Heritage Fabric Assessment for Wapping (Draft).
Austral Archaeology, June 1995

Parcel 4 Wapping. Former Hedberg Garage Building Site. CMP + Development guidelines. Draft 2.
Paul Davies Pty. Ltd., September 2003.

Archaeological Excavation of Part of Parcel 2, Wapping.
Incorporating Excavation Report, List of Appendices and a Guide to the Research Archive.
Austral Archaeology, November 2002.

Wapping Parcel 4 Archaeological Test Excavation.
Report Prepared for DED and Tourism, Austral Tasmania, May 2009.

3.3. Historical development of the subject site

In order to gain an overview of what once existed on the site, as the basis for predicting archaeological remains, the following is a brief overview of the historical development of the site based on primary source documents (the subject site depicted in red) as well as overviews drawn from the secondary sources as detailed above. Note that this is a brief historical overview, concentrating solely on physical development, sufficient only for basic archaeological planning. As per above, further historical research is required in order to refine a detailed archaeological research design, which is provided here in Section 3.4. Such detail is also required to supplement the interpretation of archaeological findings – requiring an iterative process of the assessment of findings against further historical and comparative research from both primary and secondary sources, which is provided for here in the archaeological method statement (Section 5).

Pre 1804 - Aboriginal occupation

The land was the home of the Mouheneener people for tens of thousands of years, prior to displacement by European settlers in 1804.

1810s-20s – Settlement, street gridding, subdivision and the first phase of development

Subsequent to the settlement of Sullivan's Cove in 1804, following the disbandment of the initial European settlement of Risdon Cove, the settlement of Hobart Town began to grow in a somewhat organic matter. Following Governor Macquarie's inspection of 1811, Surveyor James Meehan was engaged to rationalise the layout of the settlement and install a grid-pattern of streets, as seen on his 1811 survey plan (DPIPWE Hobart 11). That survey shows the subject site as undeveloped land on the northern edge of the Hobart Town settlement. Whilst Collins Street had been formalised at that time, Macquarie Street did not extend that far northwards. The subject site was dissected by a stream known as the Domain or Park Street Rivulet, which formed a boundary between the main settlement area and Macquarie Point where a number of early farms were established, and Macquarie had designated land for a new Government House. The area surrounding the rivulet was prone to flooding, therefore development was somewhat slow compared to the nearby higher areas.

1820s – The beginning of industrialisation:

With the spread of the settlement, the pattern of development in the area changed during the 1820s. A new site was chosen for Government House at Pavilion Point in 1821 and nearby Hunter Island was connected to the mainland by a stone causeway initiating the development of the Old Wharf in 1820-21. Further, in 1826 the nearby Hobart Town Rivulet was diverted in a channel along Collins Street and into the Domain/Park Street Rivulet (which crossed the subject site). These events acted to push the town further northwards into this area which had become more appealing with those nearby events. During the 1820s a number of houses, hotels and commercial buildings and industrial complexes were established in the area bounded by Campbell, Collins, (what was to become) Macquarie and Park (Brooker Highway) Streets. This area became known as 'Wapping' due to the perceived similarities with the London dockside suburb.

New Government regulations required that all slaughtering of animals be done at registered premises, which sparked the establishment of a government slaughterhouse on the northern side of the stream in c1822 – the northern portion of the study area includes a portion of the slaughterhouse and yards. Despite attempts to maintain the water quality of the stream, the establishment of the slaughterhouse opened up this area for the establishment of 'noxious' trades.

Several c1820 sketches/paintings looking west over Hobart, although not considered to be highly accurate in terms of spatial depiction some show building(s) within the subject site. Note that these must be read in conjunction with the likelihood of artistic license. Figure 3.3.1 shows a single (dwelling?) in what is likely to be the subject site however the slaughterhouse is not depicted (consistent with an establishment of c1821-2). The slaughterhouse is shown on two undated, but c.mid-late 1820s survey plans (Figures 3.3.2 and 3.3.3). Figures 3.3.2 and 3.3.4 show the title configurations of the area and the southern portion of the subject site is contained mostly within a single title, that of the grant to Mary Facey, Figure 1.3.2 showing the title as much larger and Figure 1.3.3 implying that the southern portion (i.e. south of the rivulet) was within a single title (and the earliest depiction of what was to become Ragged Lane on the southern edge). Note that these plans do tend to only show the major public, government and commercial/industrial buildings therefore to not necessarily imply that other development was not present in the subject site at that time. Figure 1.3.5 shows several small buildings across the site (note that perspective makes it difficult to definitively depict the subject site on these images). Figure 1.3.6 shows a clear depiction of three (dwellings?) in a reasonably well-defined subject site, which is consistent with later maps of the area (as depicted below).

During the 1820s, the Collins Street frontage between the southern portion of the subject site and the rivulet was occupied by Mary Facey and her sons, who established a woolstapling business and later a

fellmongery. The rearward portion of the site (only partially on the subject site) was a candle and soap factory which operated for most of the nineteenth century, the rear portion of that (Macquarie Street facing) allotment was residential (within the subject site) until c1890 when the candle and soap operation was extended to the rear of the site (only just within the subject site). The earliest plans show the Collins Street frontage of this part of the subject site to be the property of Robert Wilson, however Facey appears to own the property from an early date and is listed as the first grantee. The 1820s plans show the building on this part of the site to be timber and set back from the street (e.g. Figure 3.3.9). When the Hobart Rivulet was diverted along Collins Street in 1825-6 the Facey property suffered considerable damage from flooding. The Town Surveyor recommended that she build a wall round her premises to prevent similar problems in the future and later plans suggest that she did so (e.g. Figure 3.3.12). Following Mrs Facey's death, her sons remained in business at the site as fellmongers and retained ownership of the property until the 1910s when the Hobart City Council acquired the property.

Figure 3.3.1 – Excerpt from Evans' 1819 panorama of Hobart Town, showing buildings within, or in close proximity to the subject site. State Library of New South Wales a1528621r.

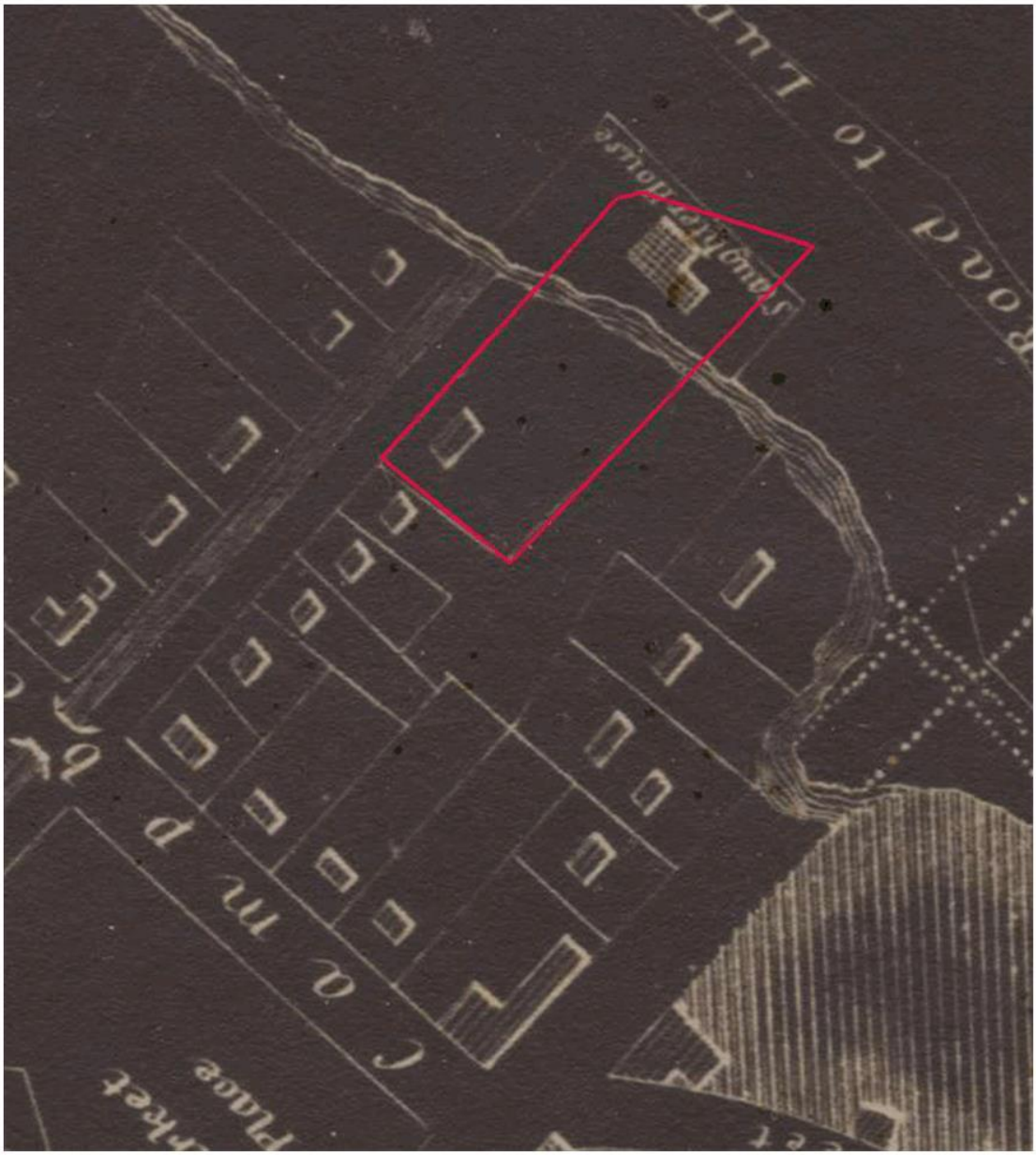

Figure 3.3.2– Excerpt from an undated (c1820s) survey plan of Hobart (Tasmanian Archive and Heritage Office, PH-30-1-693-1).

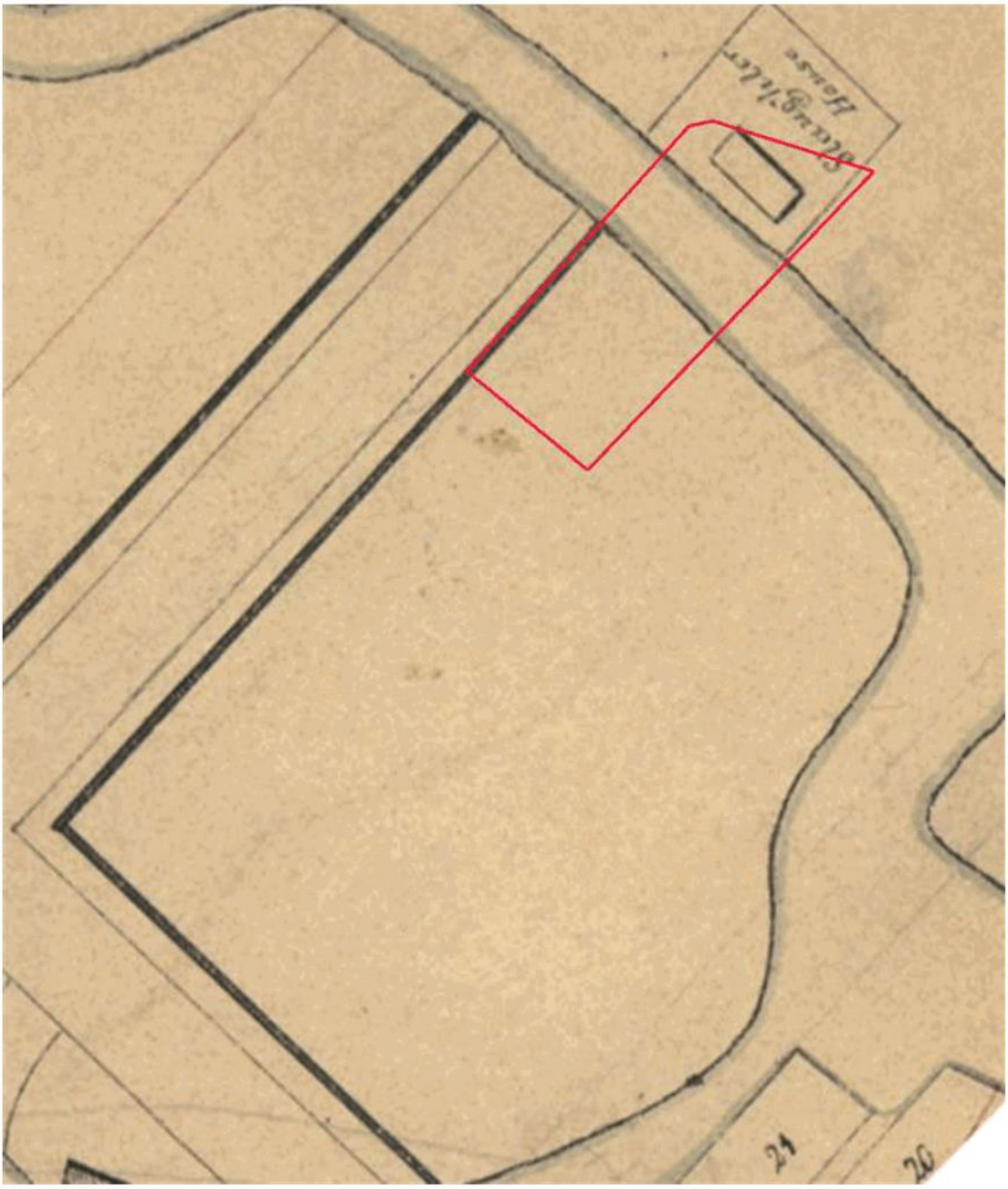

Figure 3.3.3– Excerpt from an undated (c1820s) survey plan of Hobart (DPIPWE Hobart 12).

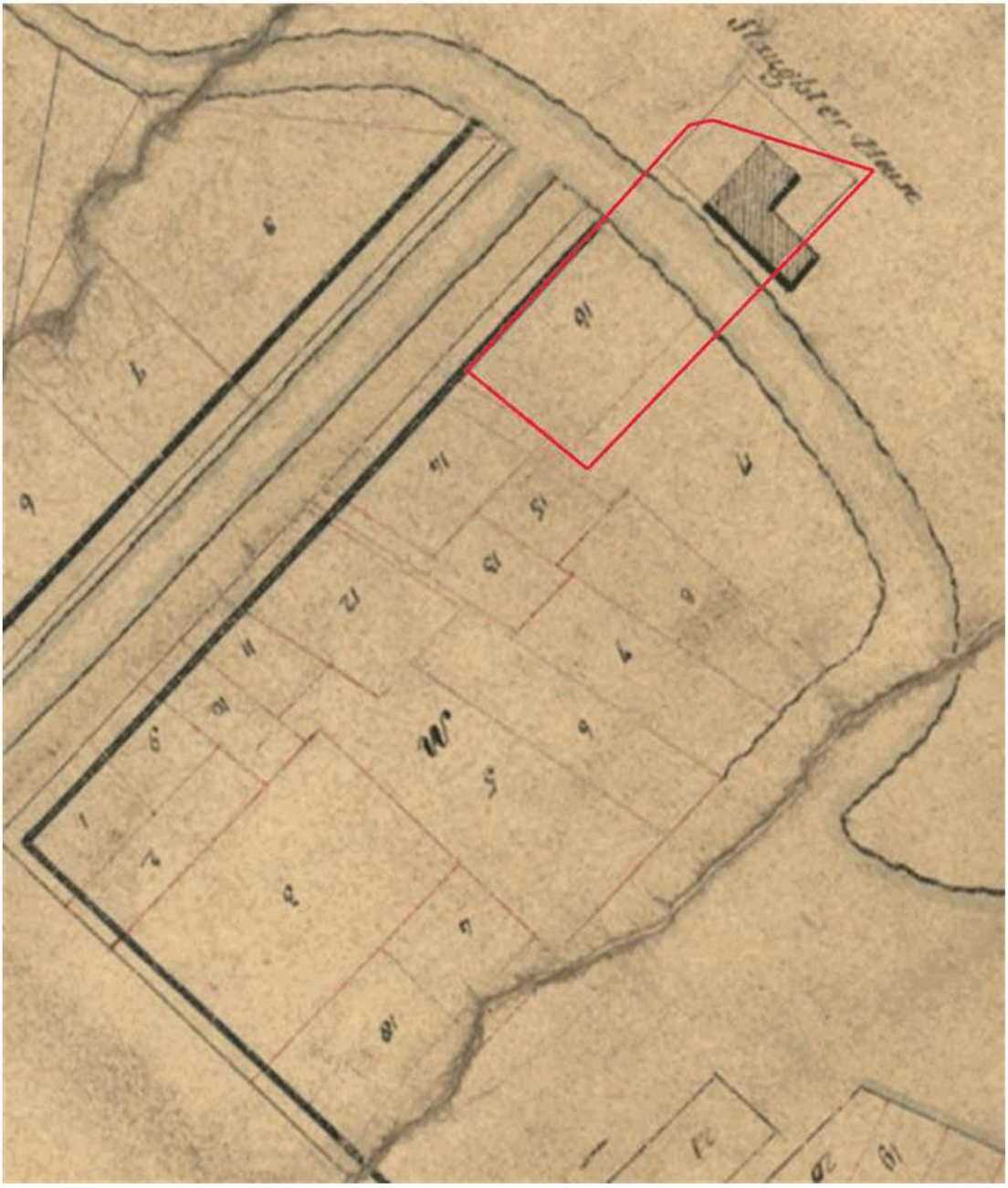

Figure 3.3.4– Excerpt from an undated (c1820s) survey plan of Hobart (DPIPWE Hobart 13).

Figure 3.3.5. – Looking east over Hobart area c1820. Note that the accuracy of this image is questionable, given some proportions and building location's which do not correlate with other sources – it is likely that this image includes considerable 'artistic licence' although it depicts a cottage in the vicinity of the subject site (approximately denoted by red arrow). Tasmanian Archive and Heritage Office PH30-1-405.

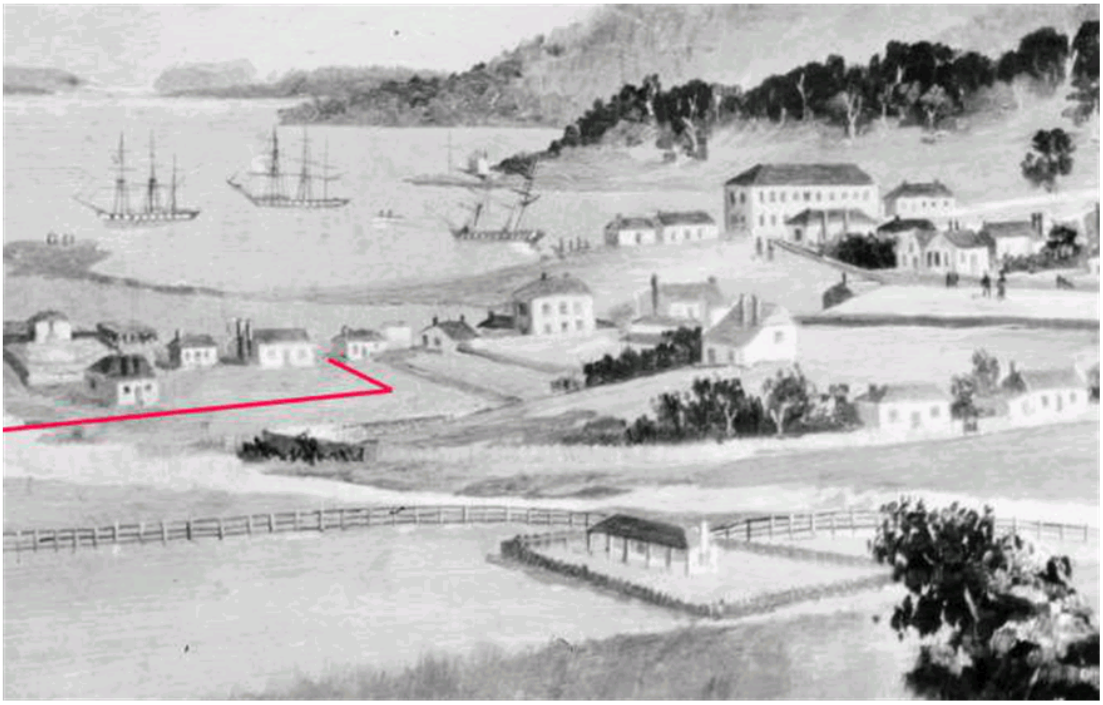

Figure 3.3.6 – Looking south towards Sullivans Cove c1822 (the building within the study area denoted by red arrow). Note that the perspective of this painting might mean that some buildings that appear to be in the study area might be behind, or on the opposite side of Argyle Street. Tasmanian Archive and Heritage Office NS1013-1-1863.

Lee-Archer's 1828 survey plan of Hobart (Figure 3.3.7) does not show any development within the subject site, however that plan only shows major government, public and commercial/industrial buildings, therefore does not imply no development in the area (although interestingly omitting the government slaughterhouse). This plan does however show details of title boundaries which again suggest that the subject site was contained within a single title at that time.

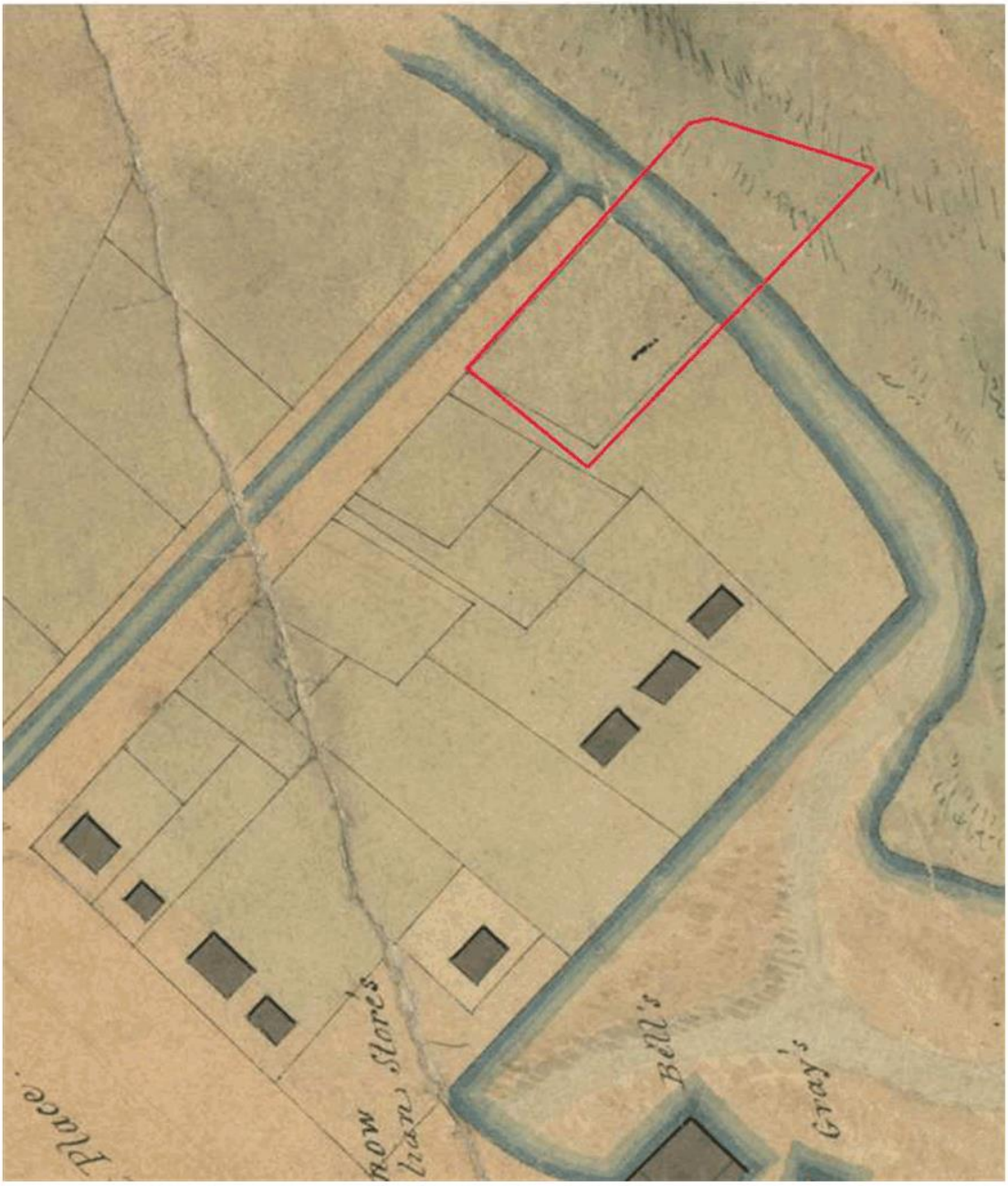

Figure 3.3.7 – Excerpt from Lee-Archer's 1828 plan of the Hobart waterfront (Department of Primary Industry, Water and Environment 90411).

Figure 3.3.8 is an excerpt from an undated, but probably c.late1820s panorama of Hobart Town from the Macquarie Point area, which clearly shows three buildings on the southern side of the rivulet and what

appears to be the slaughterhouse building on the northern side. This is consistent with survey plans of the late 1830s and early 1840s as depicted below.

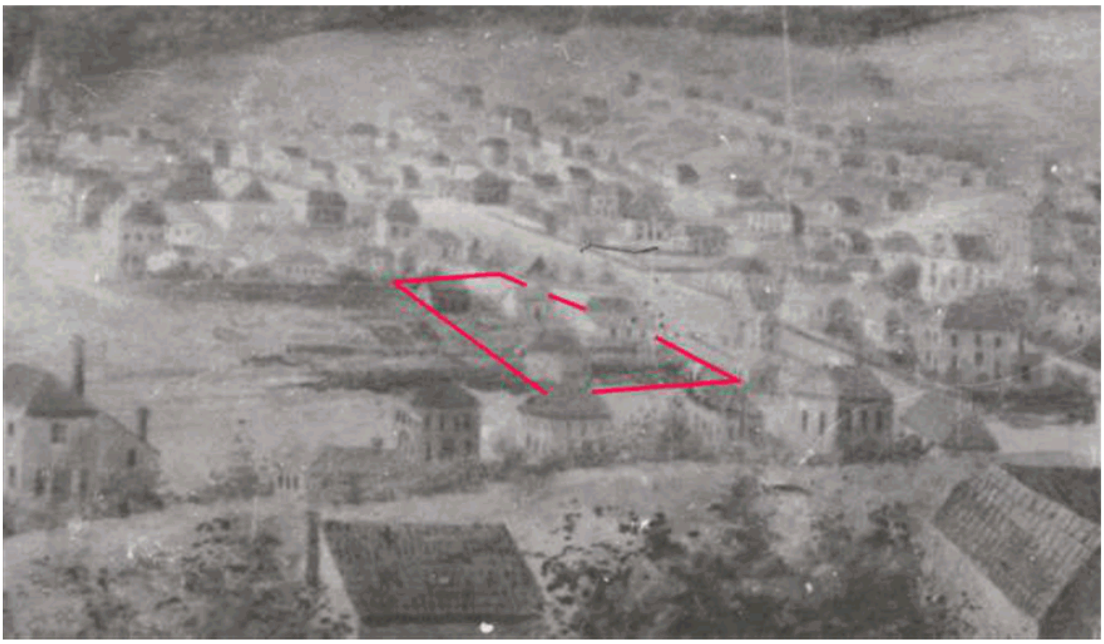

Figure 1.3.8 - C1820s Tasmanian Archive and Heritage Office PH1-30-406

1830s – Intensification of settlement.

Figure 3.3.9 is an excerpt from an undated, but pre-1839 map of Hobart and surrounds, which shows that the southern portion of the subject site had been subdivided into two allotments (with a portion of a third on the eastern edge). Three timber buildings are shown. The edge of the government slaughterhouse is depicted north of the rivulet only partially within the subject site and as a masonry building. This is consistent with the layout depicted on Figure 3.3.8. Two buildings within the Facey allotment are shown as is a small building within an internal allotment (probably a timber outbuilding) belonging to a George Schringeour, who is described in contemporary directories as a whaler. This internal block survived as a residential allotment until being taken over by the candle and soap factory c1890 and demolished for expansion of that operation.

Figure 3.3.9 – Excerpt from a c1830s map of Hobart and surrounds. DPIPWE Map Hobart 5

Frankland's 1839 map (Figure 3.3.10) shows the same configuration of the three buildings in the southern portion of the subject site, and although omitting the slaughterhouse notes that it was present on the

northern portion of the subject site. Similarly, the 1841 census map (Figure 3.3.11) shows a similar configuration of buildings (and was likely to have been largely based on the Frankland survey. Further indications of the use, function and occupancy of the building(s) could be gained from analysis of the 1841 census data.

The establishment of the 'New Wharf' (Salamanca) in the 1830s was somewhat of a death-knoll for Wapping – with new business established near the new wharf, and the decline of the 'Old Wharf', coupled with continued flooding problems from the Hobart Town Rivulet, Wapping began a decline into a squalid and unappealing area. During this period, the industrialisation of the area increased, with further noxious trades being established – for example entrepreneurs such as Joshua Ferguson opened a slaughterhouse on the corner of what is now Macquarie Street and the Brooker Highway (Park Street) (just outside the subject site) and the soap and candle factory was established fronting Macquarie Street (the rear portion of which is within the subject site). Flooding was common, particularly following the 1820s diversion of the Hobart Rivulet and property owners were forced to construct retaining walls around their properties. Silting of the Domain/Park Street Rivulet was common and the discharge of industry made the area somewhat unappealing to intensive residential purposes as seen elsewhere in the town centre.

Figure 3.3.10 – Excerpt from Frankland's 1839 map of Hobart and surrounds. State Library of Tasmania, Allport Stack 912.94661MAP.

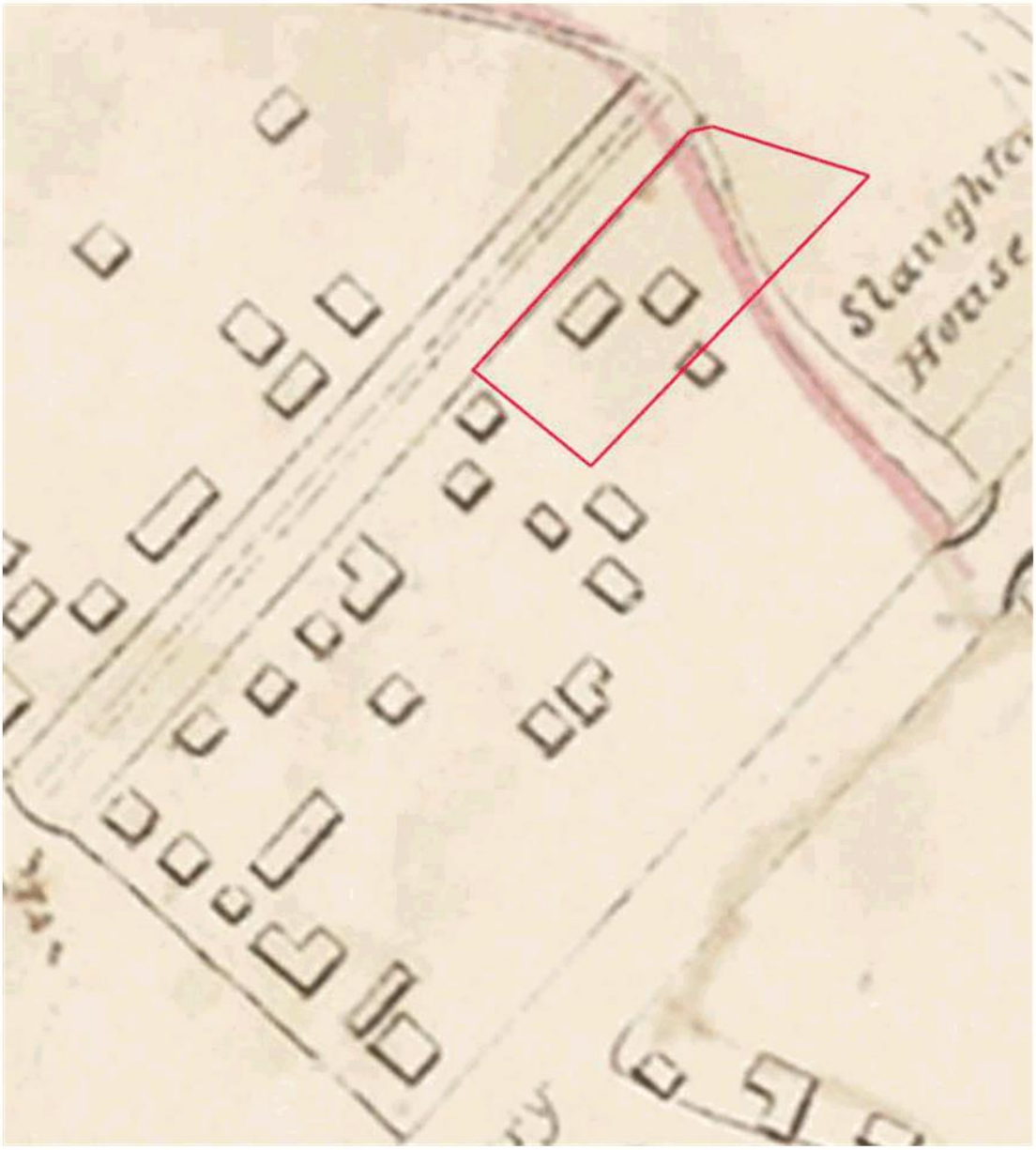

Figure 3.3.11 - Excerpt from the 1841 census map of Hobart and surrounds. Tasmanian Archive and Heritage Office, CSO8-17-578.

1840s – The rise of 'Wapping':

Figure 3.3.12 - Excerpt from Sprent's 1841 map of Hobart and surrounds (www.thelist.tas.gov.au).

Sprent's 1841 survey (Figure 3.3.12) shows that around 1840 the southern portion of the subject site appears to have been redeveloped, with a different configuration of buildings than depicted on the surveys of the 1830s. A long, timber building occupied most of the eastern edge of the southern portion of the site

and two other buildings on the site (one of which on the south-western corner may be an extended version of those depicted in earlier surveys. The slaughterhouse is depicted largely as it had previously been depicted in earlier survey, again as a masonry building.

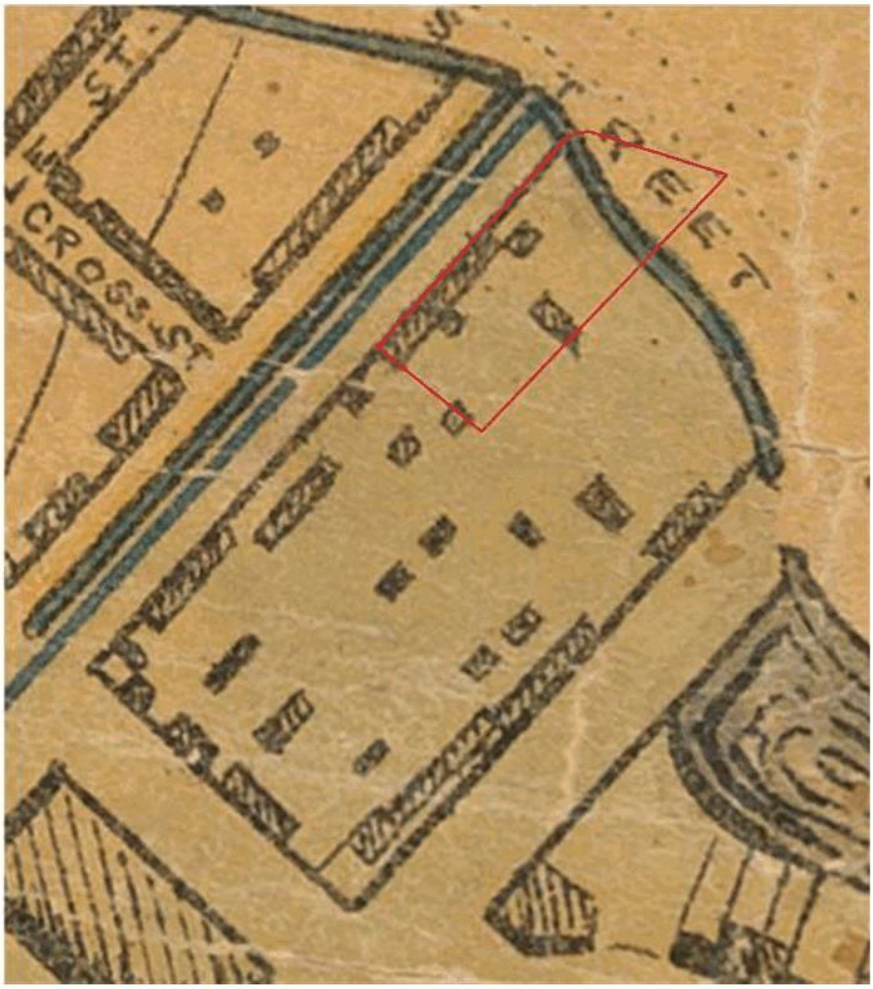

Figure 3.3.13 – Hood's 1854 map of Hobart – note the accuracy of this map is questionable (Department of Primary Industry, Water and Environment 139586747.)

1850s-1900s – The slums of Wapping.

Figure 3.3.13 is an excerpt from Hood's 1854 map of Hobart and surrounds which is largely based on Frankland's 1839 plan (with some additions) therefore its accuracy is questionable. This plan shows another reconfiguration of the subject site, with development more concentrated on the Collins Street frontage, with only a single smaller building against the eastern boundary.

The latter half of the nineteenth century saw an intensification of development on the subject site, which was still separated by the Domain/Park Street Rivulet. In 1858 the slaughterhouse was removed to a new site on reclaimed land at Macquarie Point. The old buildings and cattle pens were demolished and the land offered for sale in four lots in 1860, which were sold to Samuel Wells Roberts, Henry Martin (2 lots) and Patrick Martin. Small scale domestic and industrial development seems to have occurred shortly after (see Figure 3.3.15). Figure 3.3.14 shows a large L-shaped building in this area (one end of which may also be seen in Figure 3.3.15). Whether this is a remnant of the earlier slaughterhouse is unknown – if not its life appears short-lived as it was had been demolished by c1890. By the 1890s a substantial conjoined house (with a distinctive mansard roof) had been constructed in the central portion of the Park Street frontage and a small timber cottage offset to the street grid facing the corner of Collins and Park Streets. By c1900 a large two storey brick building had replaced the small cottage on the corner, and a smaller house to the left of the earlier conjoined house. These buildings survived until they were demolished c1958 for the current Roberts building fronting the (now) Brooker Highway.

Development to the south of the rivulet initially appears to be a series of smaller buildings set to front Collins Street and along the rear of the site. Figure 3.3.14 depicts a chimney just off Collins Street suggesting an industrial use of part of the site (and is absent off c1880s depictions) although photographs from the later-nineteenth and early-twentieth century suggest residential buildings fronting Collins Street (industry probably occurring to the rear). An intensification of the use of this area is apparent, particularly in Figure 3.3.16 with larger buildings having been constructed along the edge of the rivulet and Figure 3.3.17 showing a large number of buildings across the site. By this time, the railyards had been established on the opposite side of park Street and the general area had changed substantially. The population of Wapping around 1880 was estimated at around 2000 people.

The Roberts occupation of the area started with the purchase of the area on the corner of Park and Macquarie Streets in 1890. This area had formerly been operated as Ferguson's slaughterhouse (distinct from the early government slaughterhouse) and cattle pens. In 1891, Roberts established a wool, skin and general merchandise store (note that this area is outside the subject site). Also in 1890, the candle and soap factory facing Macquarie Street was extended, with the demolition of small-scale residential development to the rear of the site, part of which is within the south-eastern corner of the subject site.

With the establishment of the Main Line Railway in the 1870s, the reclamation off Macquarie Point for major wharf development from the 1890s, and the public perception of Wapping - the 'gateway' to the city as a

slum, there was pressure to tidy up the area and improve access to the wharves and railway. Depictions from the late 1870s (Figures 3.3.14 and 3.3.15) show a number of small buildings on the southern portion of the subject site as well as a chimney which may suggest some form of intensive industry. A building can be seen on the northern portion, which may be the then recently closed slaughterhouse, prior to the construction of the houses facing Park Street – that portion of the site remaining largely as open space, probably remnant of the animal yards from the slaughterhouse operation. Figure 3.3.14 shows the rivulet as a formalised channel.

Figure 3.3.16 shows that by the 1890s, several residences had been built on the former site of the slaughterhouse, and that the rear of these buildings had a large open space. Intensive use of the southern portion of the subject site appears to have continued to that time.

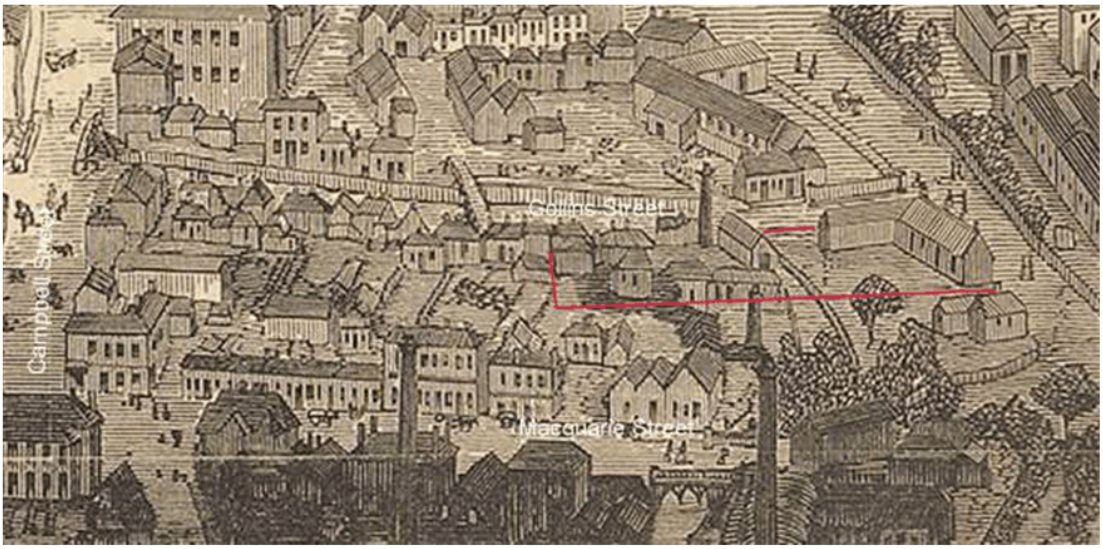

Figure 3.3.14 – 'Balloons eye view of Hobart' showing the c1820s building frontage (red arrow) and the c1840 conjoined buildings (blue arrow). Australasian Sketcher 10 May 1879.

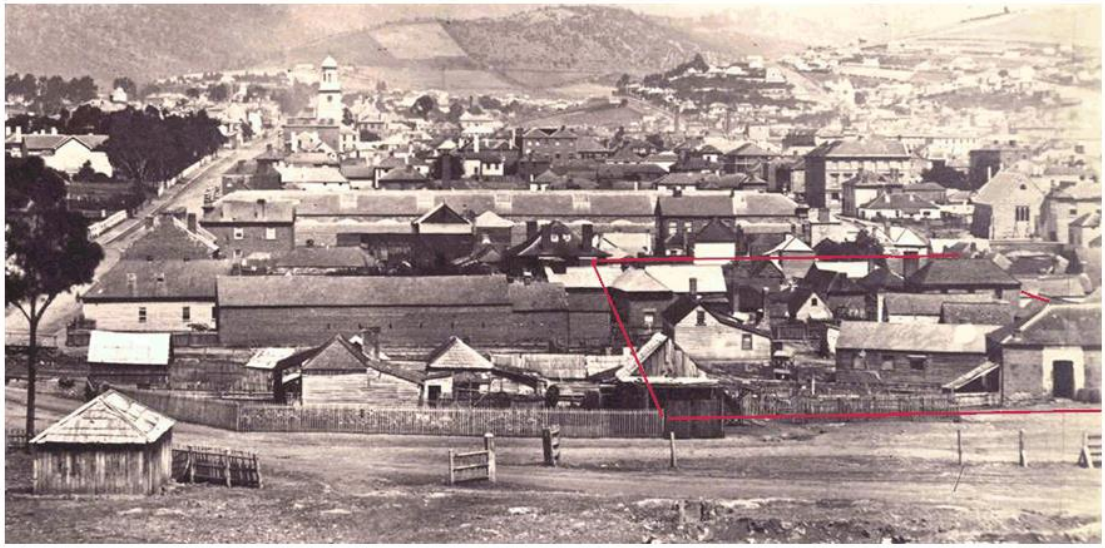

Figure 3.3.15 – Undated, but probably c1880s University of Tasmania, Royal Society Collection.

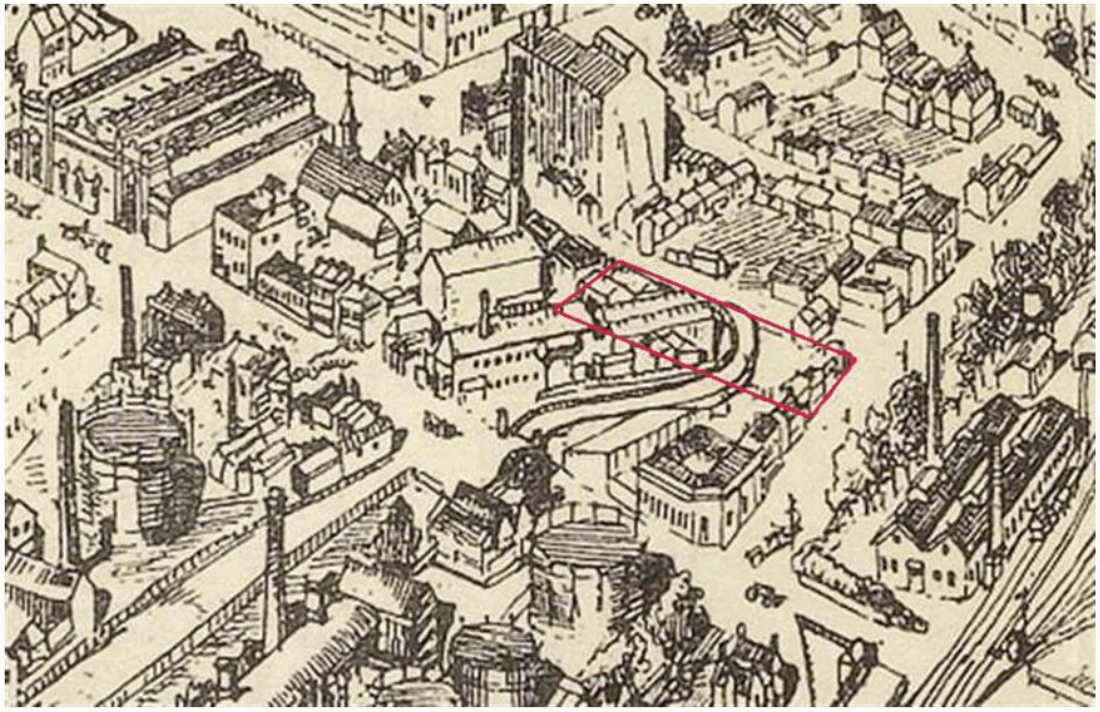

Figure 3.3.16 – Excerpt from a 'Hobart Birds Eye' view, The Town and Country Journal Nov 17 1894 pp26-7.

Figure 3.3.17 – View of the Park Street frontage of the subject site (denoted by red line) from the railyards, probably c1890. This shows the conjoined townhouses as well as a large number of buildings within the subject site (the exact rear boundary is difficult to ascertain with this perspective). Colin Dennison Collection.

1900-1930 – Rivulet diversions and clearance

The houses fronting Park Street seem to have continued use as dwellings during the first half of the twentieth century, with their rear yards (to the rivulet) containing ancillary buildings. Further intensification and mixed use of the southern portion of the subject site continued through the turn of the twentieth century, with Facey's fellmongery business continuing to operate. The council continued to face the issues of flooding of the area caused by the convergence of the Hobart and Domain/Park Street Rivulets and the perception that the area was a slum, which caused embarrassment at the gateway of rail and port linkages to the city. By the 1910s, the population of Wapping had halved from that of c1880.

A scheme was devised to divert the rivulets through twin tunnels under the Domain to a new outfall to the north of Macquarie Point. Work began on the scheme in 1916 and necessitated the acquisition of properties in lower Collins Street (apparently including the Facey buildings), which were demolished. Photographs from the time show that the area was low lying, with the rivulet walls offering some flood protection. At the time of the rivulet works, fill was deposited widely over the area to build up ground levels. The scheme was not completed until the mid-1920s. The former bed of the Domain/Park Street rivulet through the middle of the study area was reclaimed and offered for sale in two lots in 1924 - one fronting on Macquarie Street, the other fronting on Collins Street. Both lots were purchased by Roberts & Co.

A large warehouse was constructed facing Macquarie Street shortly thereafter, and extended rearward with a Collins Street frontage in 1936 (i.e. crossing the subject site). This substantially increased Roberts holding in the area – expanding their operations formerly concentrated on the corner of Macquarie and Park Streets. Roberts then sought to acquire further land in the area, and in 1928 purchased 2-14 Collins Street and had by that time also acquired 2-8 and 16-18 Park Street. By that time, Roberts then owned almost half the city block bounded by Park, Collins, Macquarie and Campbell Streets.

Figure 3.3.18 - Plan showing proposed new channel for the Hobart Rivulet. c. 1910, the subject site outlined in red. Tasmanian Archive and Heritage Office PWD 266/2494/6].

Figure 3.3.19 – Excerpt from a C1910 photograph looking north along lower Collins Street, the Terminus Hotel (now the corner of Terminus Row and Collins Street) in the foreground and buildings within the subject site depicted by red arrows. Tasmanian Archive and Heritage Office PH30-1-3023.

The buildings on the original Facey land (i.e. the area south of the Domain/Park Street Rivulet facing Collins Street – the fellmongery business) were demolished by Council prior to 1925 (see Figure 3.3.20) and the land was offered for sale in several lots. Following the 1925 sale of part of the land which had been acquired by Council, with little interest in the remainder Council constructed a garage on the original Facey portion of the land – the façade and roof of which remains standing. By 1956, Council had little use for the building which was subsequently leased to a succession of tenants and was later purchased by Roberts and partially demolished.

Figure 3.3.20 – Excerpt from a panorama of Hobart, c1910 with a two-storey building within the subject site (facing Park Street) depicted by the red arrow. Tasmanian Archive and Heritage Office NS1231-1-24.

Figure 3.3.21 – Looking north along lower Collins Street, c1910s, with the Collins Street frontage of the subject site to the right of the photograph (approximately outlined by red lines). The turn in the rivulet can be seen with a two-storey building fronting Park Street and what appear to be two domestic buildings facing Collins Street. Tasmanian Archive and Heritage Office NS1013-1-3.

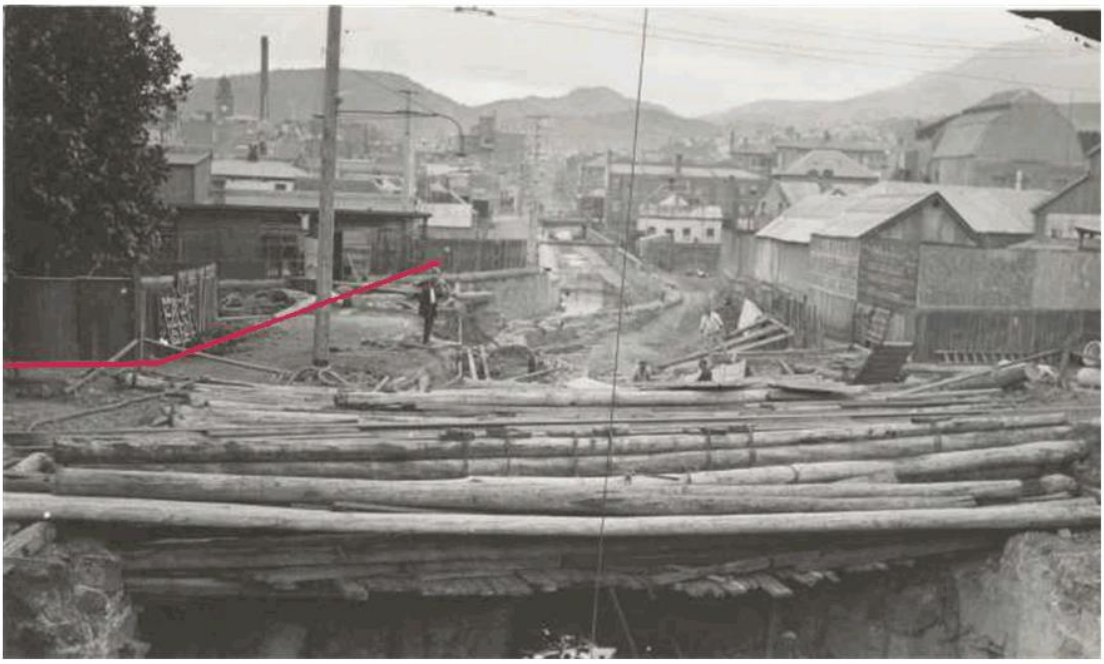

Figure 3.3.22 – Looking south along lower Collins Street, c1910s, with the corner of the subject site to the left of the photograph (approximately outlined by red lines). The turn in the rivulet can be seen. Tasmanian Archive and Heritage Office NS869-1-447.

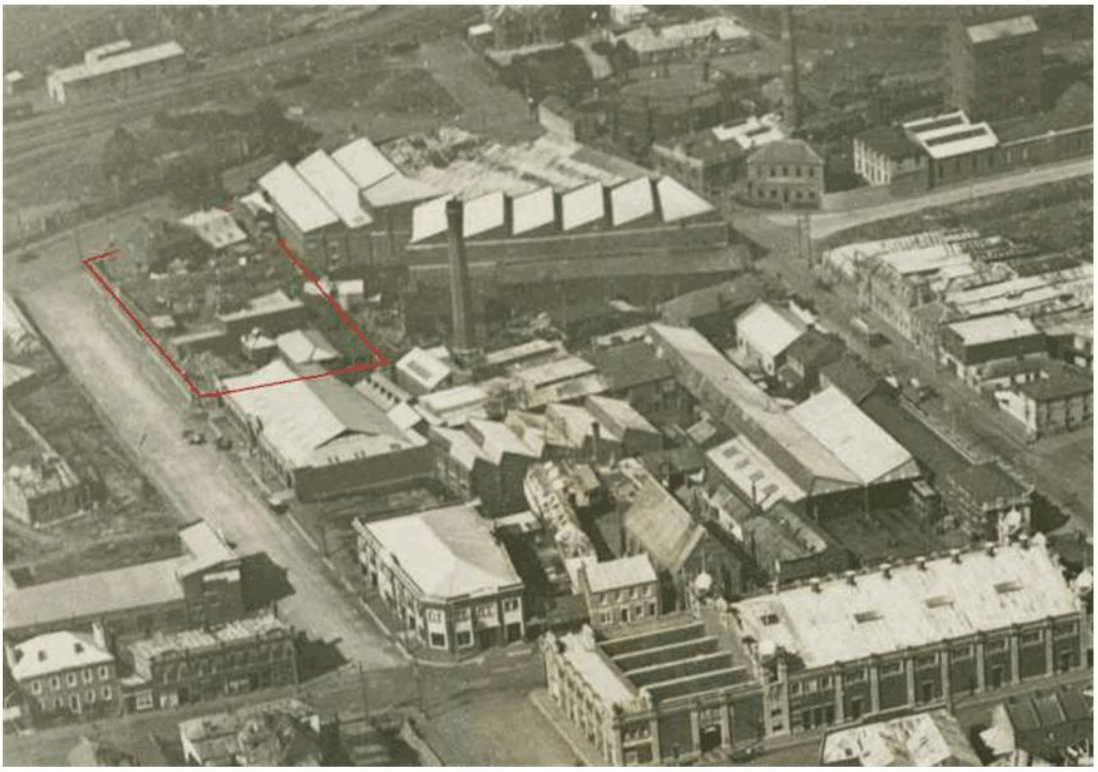

Figure 3.3.23 – Excerpt from an oblique aerial photograph of Hobart, c.mid-1920s. The subject site outlined in red. This shows the first stage of the Roberts store on the former line of the rivulet, and that the HCC garage had not been built (rubble on that part of the site may be from the demolition of the Facey buildings). The buildings fronting Park Street are still standing. Tasmanian Archive and Heritage Office NS 892-1-64.

Figure 3.3.24 – Excerpt from a panorama of Hobart, c.late 1920s, showing the residential buildings facing Park Street and the garage building to the rear (fronting Collins Street – the roof and façade of this building still stand), the approximate subject site outlined in red. Tasmanian Archive and Heritage Office PH30/5096.

Post 1950 – Regeneration

The 1946 aerial run of Hobart shows the Roberts buildings weaving the former course of the rivulet and concentrated on the corner of Macquarie and Park Streets. Three houses fronting Park Street remained standing and the HCC garage and other buildings fronted Collins Street adjacent to the Roberts frontage of that street. The pre-1910 'L-shaped' building next to the garage was still standing. The buildings facing Park Street were demolished around (or prior to) 1958 when Roberts built the first phase of the existing office building/store.

Figure 3.3.25 - The subject site taken from the 1946 aerial run of Hobart (Run 1, 10894).

Figure 3.3.26 - The subject site taken from the 1958 aerial run of Hobart showing the current store building under construction (Run 5, T332-12 March 1958).

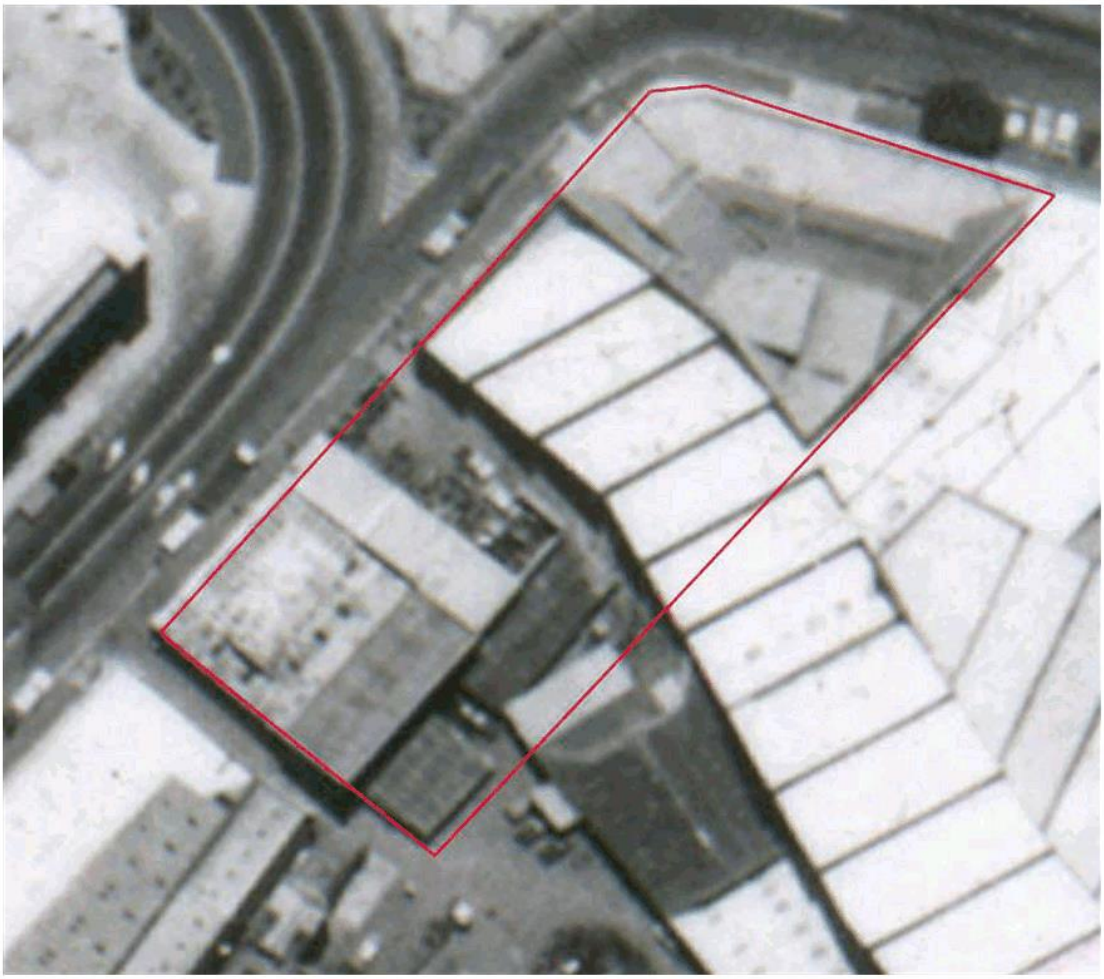

Figure 3.3.27 - The subject site taken from the 1968 aerial run of Hobart (Run 6-153 February 1968).

Summary of development

The above historical summary shows that:

- Until the first quarter of the twentieth century, the subject site was distinctly divided by the Domain/Park Street Rivulet (until rivulet diversion works between 1916-25).
- The northern side of the rivulet was occupied from c1822 to 1858 by the government slaughterhouse and yards. Following closure of the slaughterhouse, the land was sold and developed as three residential properties, which survived until the c1958 redevelopment of the site for the current building.
- The southern side of the rivulet was occupied from possibly as early as 1819 as a residential allotment, which was further developed in the 1820s as a wool processing facility and fellmonger. It seems that this enterprise resulted in a redevelopment of the allotment prior to 1841 It is possible that there were other industries and/or residential buildings on that lot, with the fellmonger business and buildings surviving until the early 1920s.

The following figures show overlay plans of known historic development on the subject site:

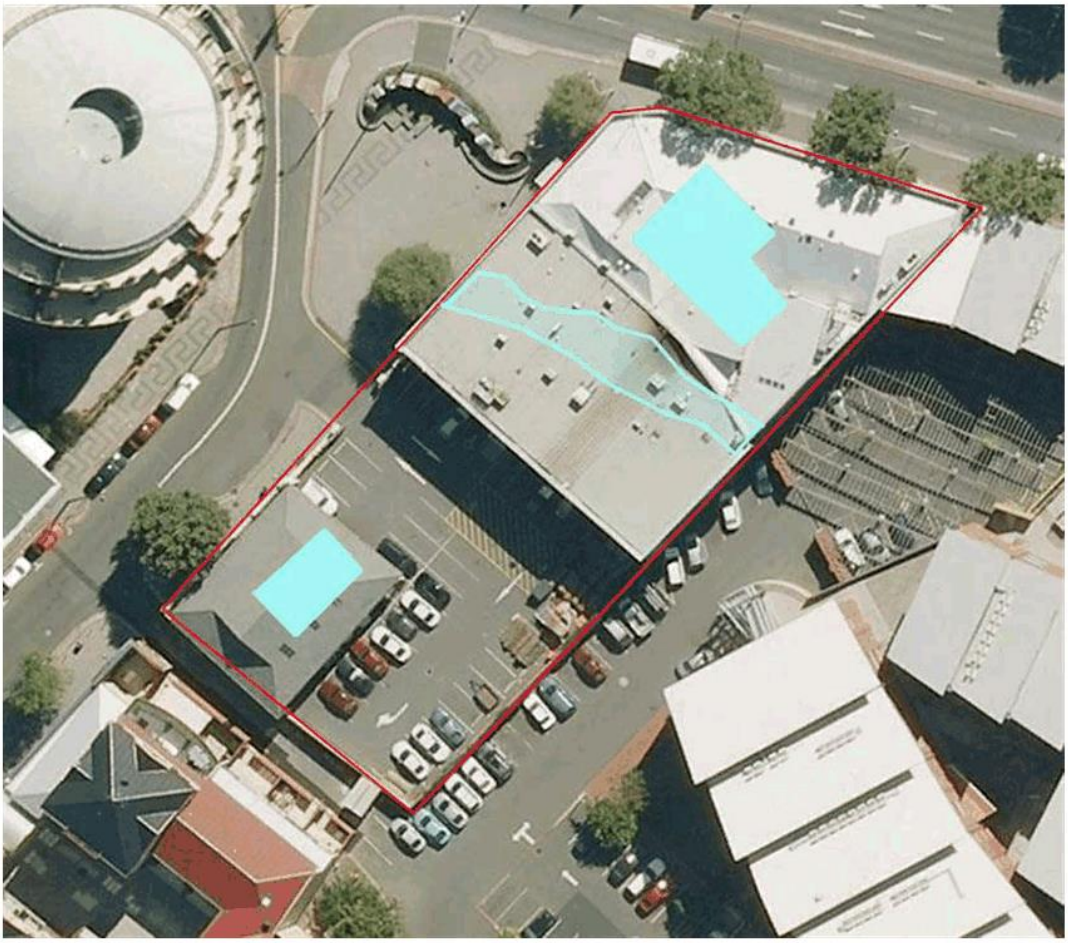

Figure 3.3.28 – Overlay of the footprint of the pre1827 buildings (light blue) in relation to the subject site (red) – drawn from the 1827 Sharland survey.

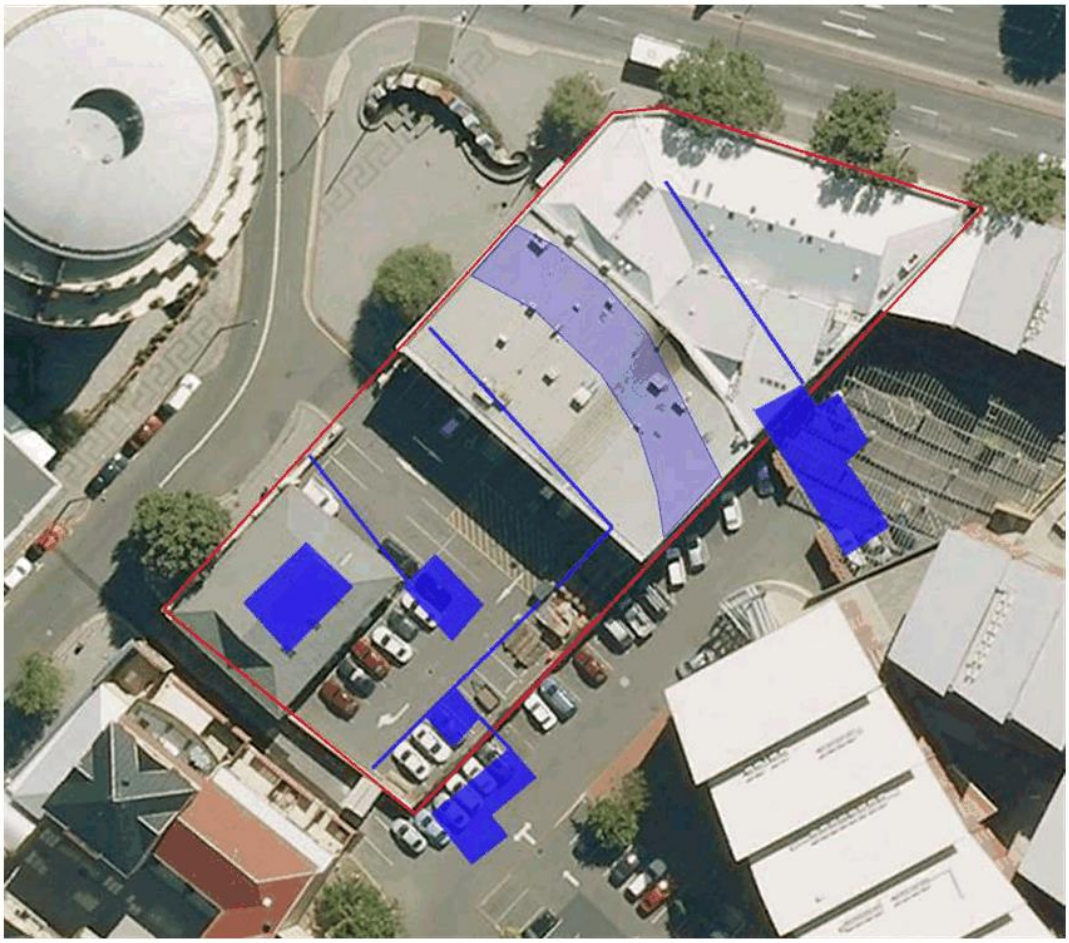

Figure 3.3.29 – Overlay of the footprint of the pre1830 buildings (blue) in relation to the subject site (red) – drawn from the c1830 survey.

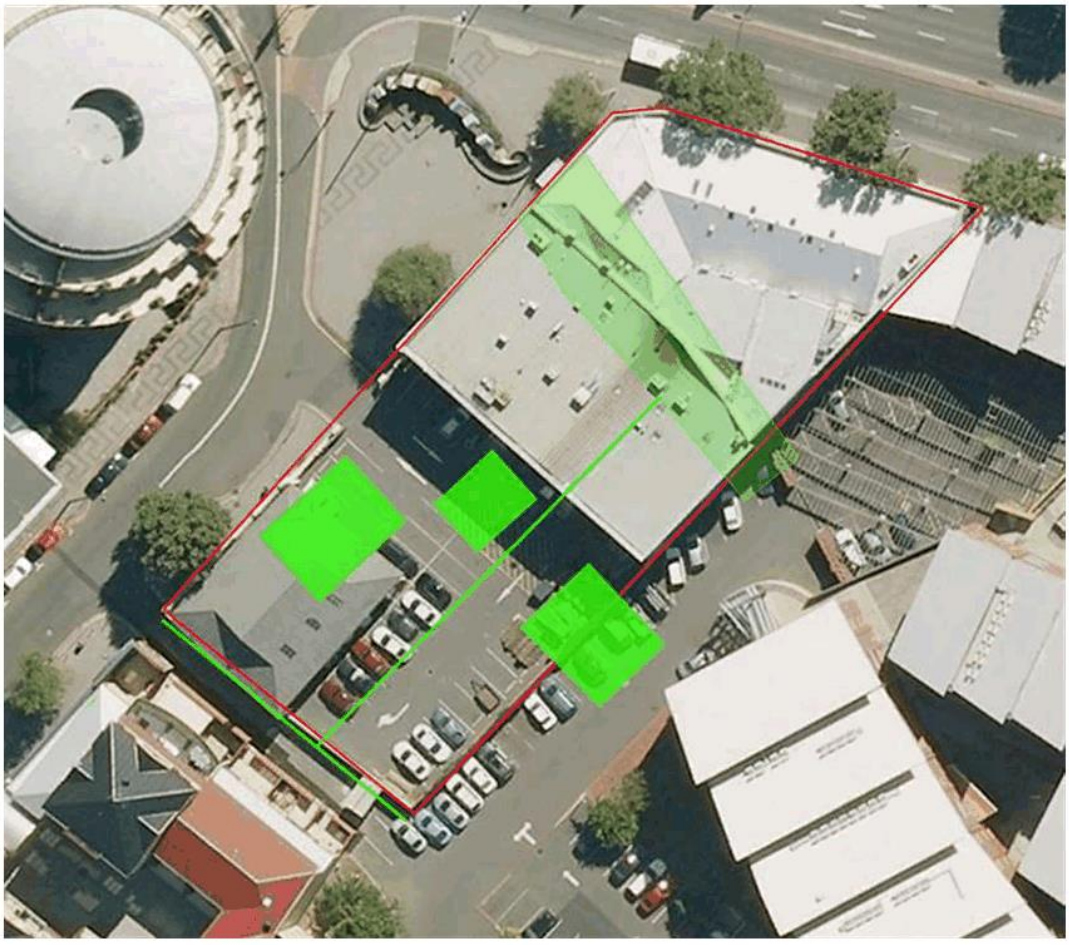

Figure 3.3.30 – Overlay of the footprint of the pre1839 buildings (green) in relation to the subject site (red) – drawn from the 1839 Frankland Survey.

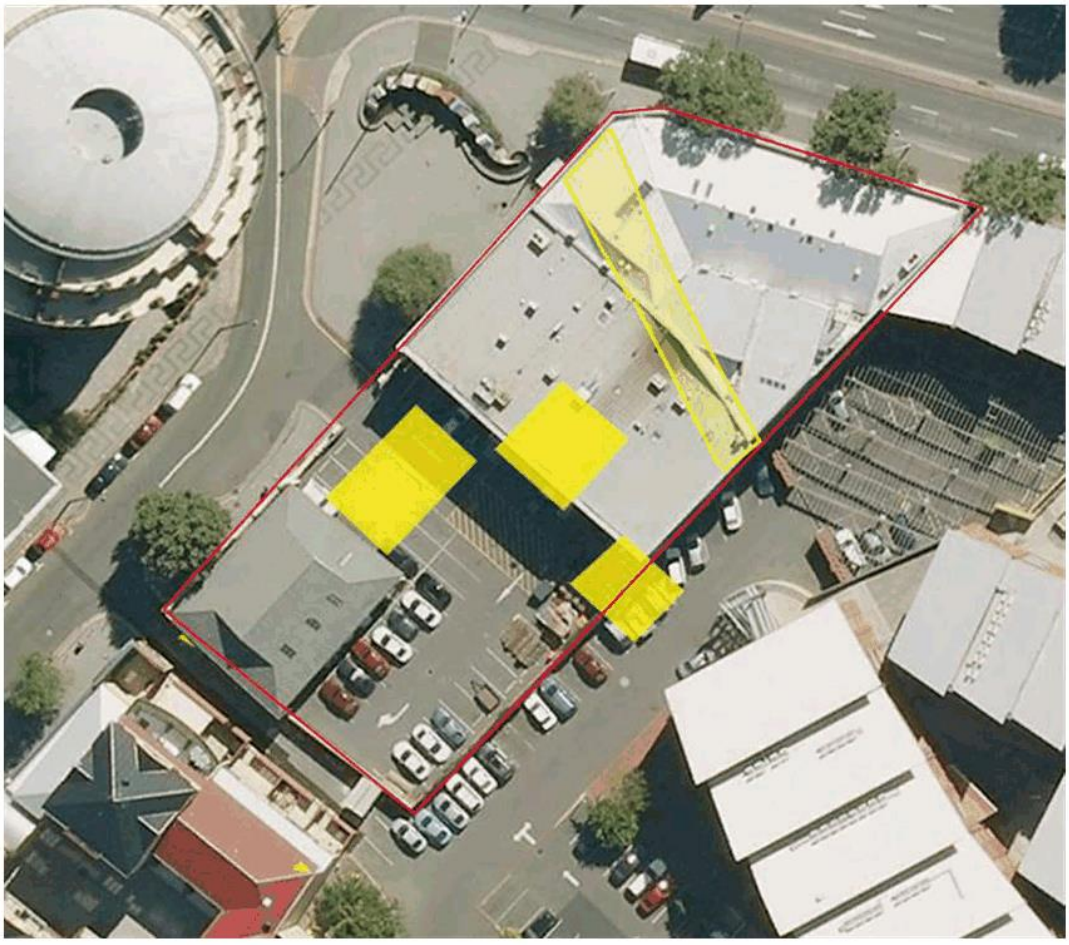

Figure 3.3.31 – Overlay of the footprint of the pre1841 buildings (yellow) in relation to the subject site (red) – drawn from the 1841 Census map.

Figure 3.3.32 – Overlay of the footprint of the pre1841 buildings (orange) in relation to the subject site (red) – drawn from the 1841 Sprent map.

Figure 3.3.33 – Overlay of the footprint of pre 1910 buildings (dark green) in relation to the subject site (red). From the 1910 HCC rivulet diversion plan,

Figure 3.3.34 – Overlay of the footprint of pre 1946 buildings (pink) in relation to the subject site (red). From the 1946 aerial photograph.

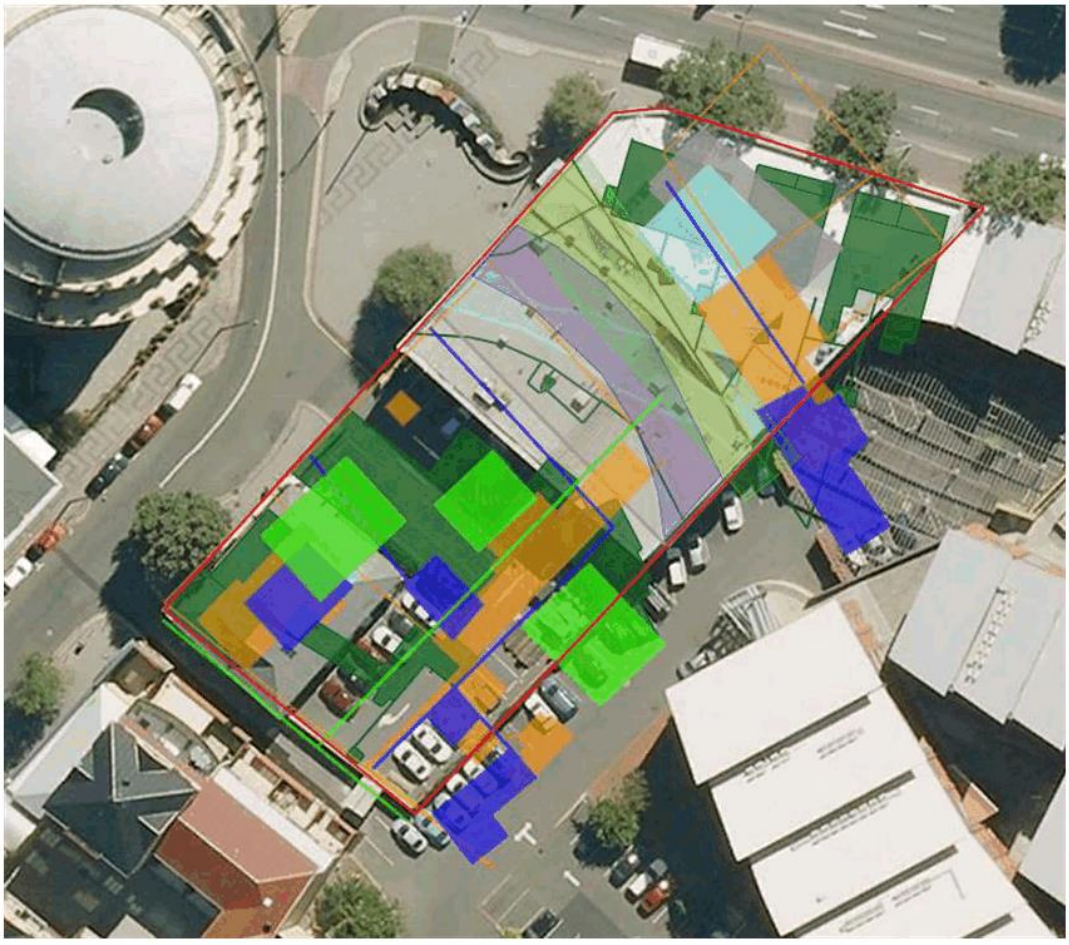

Figure 3.3.35 – Composite overlay of the footprint of all known pre-1910 buildings and site features (colours as per coding above) in relation to the subject site (red).

Figure 3.3.36 – Composite overlay of the footprint of the 'best fit' footprint of the slaughterhouse and later nineteenth century houses on the northern portion of the subject site (colours as per coding above) in relation to the subject site.

3.4. The likely significance and research potential of archaeological remains

As depicted above, the subject site was the location of a residence constructed prior to 1819, the government slaughterhouse constructed c1821-22 and a number of other residential and commercial/industrial enterprises throughout the nineteenth century, including a woolstapling and fellmongers business from the 1820s (which operated for almost a century).

Paul Davies in the 2002 conservation management plan for the nearby Hedburg Garage (pp11-12), provides a very comprehensive 'thematic stocktake' relevant to the heritage of the Wapping area, within which the analysis of the archaeological potential of the subject site can be framed. This includes:

- Houses (domestic life) - 80 known houses dating back to the 1810s
- Hotels – 7 known hotels dating back to the 1810s
- Entertainment – Theatre Royal
- Schools – Ragged School (12 Collins Street)
- Religion – St Davids Mission Church
- Garages – 5 garages dating back to 1908
- Industry – Including cordial factory, smithy, timber yard, woodbending factory, tannery, jam factory.

In addition, the following themes are relevant to the subject site:

- Fellmongers
- Woolstapling
- Control of water (rivulet diversions etc.).

As per the findings of this document, the subject site has the potential to yield information which contributes to a knowledge of these themes and their analysis in local, wider thematic and temporal contexts.

A substantial amount of archaeological research has been undertaken within the Wapping area (as well as the wider Hobart city centre). The documents cited in Section 3.2 detail this work, which is summarised below as a means of contextualising the archaeological potential of the subject site. From the mid-1990s, the Wapping Implementation Project aimed to guide the redevelopment of Wapping and included an in-depth analysis of the history, thematic contexts and archaeological potential of the Wapping area. This

project identified six 'parcels' where the archaeological potential was further detailed and several archaeological projects have stemmed from that initial assessment.

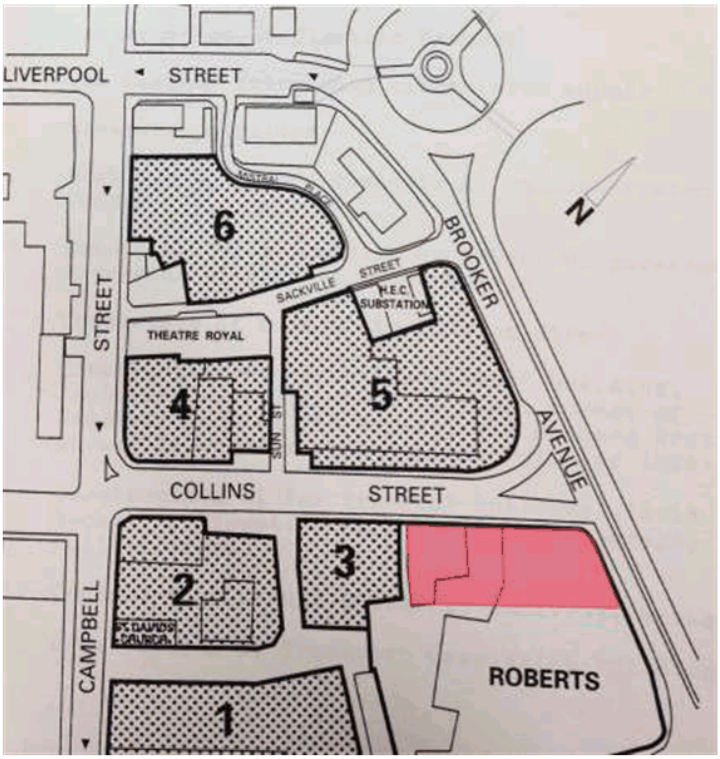

Figure 3.4.1 – Wapping 'parcels' as identified in Rayner (1994:3), the subject site denoted in red.

In 1995, Austral Archaeology undertook a fabric assessment of the Wapping parcels, which also included an overview history of the area and provided a thematic framework within which heritage and archaeological assessments could be undertaken. A series of archaeological research questions were posed, which are relevant to the subject site and are reviewed and expanded below. Those documents also propose management guidelines for the parcels, which are reviewed in the current document. In 1996, Austral Archaeology undertook test excavations on the former Shakespeare Tavern site in Parcel 4, which determined the presence substantial structural remains immediately below the paved surface, and a floor level 1800mm below current ground level – confirming the likelihood of filling in the area.

Following test excavations in 1998 (which also confirmed historic floor levels at 1.5-2.0 metres below existing street level), in 2002, Austral Archaeology undertook a wide-ranging series of excavations within Parcel 2 of Wapping. These excavations fulfilled both a broadscale and wider sampling program, covering six early allotments and have provided a comprehensive dataset across a range of site types within that parcel. In 2009, Austral Tasmania also undertook further excavations on Parcel 4 (further to a 2005 detailed historical archaeological assessment), which further demonstrated the archaeological potential of that parcel as well as the potential for analysis of the Wapping area as an early and diverse inner-city Hobart community. Further investigation of that parcel is likely in the near future as it is scoped for redevelopment. Whilst Parcels 1,3,5 and 6 are yet to be further investigated, the results from (and forthcoming) Parcels 2 and 4 provide a good level of baseline data against which any archaeological results form the subject site can be analysed. Excavations in Parcel 2 indicated that historic cultural remains were very deep, in some cases spanning 1.75 metres from the most recent to earliest deposits.

Such analysis also has the potential to add depth to other similar such analyses of early-mid Victorian Hobart high society such as that undertaken as part of the nearby Menzies Centre (Liverpool/Campbell Streets) excavations, which investigated several prominent 1820s-onwards inner city residences, including Crowther's (Godden Mackay Logan/Arctas). Similarly, investigations at Peter Degraves house in Collins Street (Hadleys Hotel development, Godden Mackay Logan) and preliminary investigations at the original Hobart Port Officer's residence at 100 Salamanca Place (Praxis Environment) have investigated prominent early inner city residential sites. Forthcoming excavations on other prominent Hobart residences such as Kemp's house (36 Argyle Street), Judge Pedder's house (173 Macquarie Street), Crowther's house/surgery (177 Macquarie Street) and Orr's house (3 Montpelier Retreat) will also act to build upon knowledge and provide comparative datasets of early and substantial Hobart residences. The results from these investigations are useful comparative datasets at the other end of the domestic spectrum to the Wapping 'slums' and any results from the Wapping area will add to knowledge across the board on early Hobart society.

From a wider regional perspective, archaeological data and remains yielded from the subject site, whether coupled with other Hobart/Tasmanian data, has the potential to strengthen a comparative dataset for research into intra-colonial society through comparison with mainland (and indeed inter-colonial society on an international level). For example early inner-city working-class communities such as Broadway, Cumberland/Gloucester Streets and the Rocks (Sydney) and Little Lonsdale Street (Melbourne) and portside

working-class areas such as Port Adelaide, all of which have had substantial archaeological works undertaken, would provide useful datasets for the analysis of Wapping data, which would in-turn add to the depth and scope of the analysis of those collections on the range of themes as outlined above (and others).

From a temporal perspective, any remains from the earlier occupation of the site (i.e. pre-1830) represent a very formative period of Hobart's European settlement and are likely to be of significance when considering their research potential – in particular the site of the pre-1819 house and the early Facey operations on the site. Given that the subject site was used for both residential and commercial/industrial purposes by that family for around 100 years, analysis of the evolution of the site and evidence of activities undertaken thereon have the potential to yield information on the changing face of Hobart during that century, particularly within the context of the growing port and railway infrastructure nearby.

Consistent with the 'Tiered research question' approach outlined in the Tasmanian Heritage Council's *Guidelines for Historical Archaeological Research on Registered Places*[3], the following questions could be investigated in the archaeological remains expected to be present within the subject site:

Tier 1 Questions: These questions outline the essential knowledge base needed for any site research or significance evaluations. Such questions are often empirical in nature, and straightforward answers can be sought and often identified – generally limited to a physical knowledge of that particular place. Questions relevant to the subject site may include:

- How closely did the buildings and site features (including outbuildings, the rivulet etc.) conform to the historic plans?
- Can the earliest date of occupation of the place be identified?
- What construction methods were used in the buildings and other infrastructure?
- What evidence of alteration of the natural landscape is archaeologically determinable (e.g. filling of the site etc.).
- Are the distinct use/development phases of the buildings distinguishable?
- Can the layout and function of the buildings, and indeed individual rooms or yard spaces be ascertained?

[3] http://www.heritage.tas.gov.au/media/pdf/Archae%20ResGlines%20%20FINAL%20-%20June%202009.pdf

- How thoroughly were the buildings demolished?

Answers to these questions provide a foundation of information about the structure, type, use and duration of site occupation which enables the researcher to consider a second tier of questions.

Tier 2 Questions: Conclusions that can be drawn about a site that connect the material remains found on a site to specific behavior. For instance, how do artifacts relate to the lifeways of the households that lived on the site, or occupations undertaken on the site? For instance, do any artifacts represent class, gender, taste and health/hygiene of those living on the site? Particularly if artifacts can be specifically dated, and with supplementary historical research, artifact assemblages from this site may contribute knowledge and provide tangible connectedness to known inhabitants and their families, and how they lived. Similarly, do artifacts or structural remains correlate with the known activities and occupations undertaken on the site (e.g. fellmongering, slaughtering etc.). How do these demonstrate the mix of residential, commercial and industrial uses of the area?

Tier 3 Questions: These questions represent the highest level of inquiry. Such questions associate the activities and behavior at individual sites with broad social, technological and cultural developments – which can be of interest on local, national or global lines of enquiry. Whilst these questions posed for a single site may not reach conclusions in the short term (as Tier 1 and 2 questions might) – the collection of data can contribute to future research by the provision of a comparable dataset. The goal of such research is to develop increasingly refined and tested understandings of human cultures within broader theoretical or comparative contexts. Lines of wider enquiry that findings from within the subject site may contribute to are:

- Do the conclusions on gender, class, economic and social status of the inhabitants of the buildings conform to the 'normal' early-mid Victorian household?
- Are there class or status differences evident in the material culture of the inhabitants of this area (subject to further historical research) when compared to, say, other early Hobart residents (including other Wapping sites previously investigated), or residents in contemporary rural areas and/or other cities. Does this support the notions of Wapping's rise and fall from a desirable area to a slum?

- Did any changes in material culture through time in the residences coincide with wider Tasmanian or local events or technology (e.g. end of convict labour, urbanisation/development of Hobart, port/railway upgrades, start of rubbish collection etc.)?

3.5 Current site observations and assessment of prior disturbance

As per the methodology outlined in Section 2.1, Section 3.3 has formed a desktop assessment of the factors which have influenced the development of the possible archaeological resource within the subject site over a 180+ year period. This has indicated that the subject site has been the site of residential, commercial and industrial development, which as per Section 2.1 would have left archaeological traces (in the absence of disturbance).

However, it is critical to understand other factors, in particular site disturbance, which may have impacted upon the archaeological potential of the site and its ability to provide meaningful archaeological remains which answer research questions such as those above. This section will review site observations and likely scenarios which would have resulted in disturbance, in order to assist in understanding the likelihood of the survival of archaeological remains.

General site observations

The site comprises of three main elements – the Roberts building, the carpark and a portion of the c1926 former garage.

The Roberts building was constructed in three major phases – the Brooker Highway frontage (c1958), the rear warehouse (opening to carpark) (c1970s) and an infill section between these buildings (c1980s). The ground floor of the building is largely clearspan (approx. 1500 square metres), with minimal columns and partitioning of the Brooker frontage building comprises of only lightweight partitioning. This suggests that the foundations are limited to the perimeter of the building, the few internal walls and the immediate vicinity of the piers (the original plans for these buildings could not be located for confirmation) – therefore widespread disturbance for strip footings may not have occurred. The floor is a concrete slab appears to be substantial and the floor level is around 1.5 metres higher than the ground level around the adjacent c1890s woolstore (Old Woolstore Apartments) – suggesting that the area had been filled prior to the construction of the Roberts building in 1958. All of these factors suggest that there may have been minimal disturbance to deeper archaeological deposits with the construction of that building – i.e. a foundation system with limited footprint and a buildup of ground level (rather than bulk excavation).

Figure 3.5.1 – The Collins Street/Brooker Highway frontage of the former Roberts building (Google Earth).

Figure 3.5.2 – Lightweight internal partitioning of the Brooker Highway frontage of the former Roberts building.

Figure 3.5.3 – Open layout of the rear portion of the building.

The c1926 former garage at the southern end of the subject site (corner of Collins Street and Ragged Lane) has been partially demolished with only the façade, Ragged Lane wall and modified roof structure remaining. The floor of this building is a bitumen carpark. Plans for this building could not be located, however as it was constructed by the Hobart City Council shortly after rivulet diversion works, and with the likelihood of extensive filling of the area at that time, it is likely that the construction of this building (and subsequent partial demolition) would not have disturbed deeper archaeological remains (for example, plans for the contemporary former Hedberg Garage across Collins Street show that the site was filled by up to a metre prior to construction of that building).

Figure 3.5.4 – The remaining portion of the c1926 garage building.

The carpark area is approximately 1500 square metres (including the footprint of the former garage) and is a largely level area sealed with bitumen. No indication of any underlying archaeological remains can be ascertained from inspection, the only useful observation being that the carpark is above the level of the ground of the adjacent Old Woolstore complex (from up to 1.5 metres at the Brooker end, to around 600mm at the Ragged lane end) – again suggesting that the ground has been built-up in this area.

Figure 3.5.5 – View across the carpark, facing north.

Likely specific disturbance events

Whilst the observations above detail the site evidence of disturbance, a disturbance history can also be built from a desktop assessment - i.e. known events which are likely to have impacted upon archaeological remains. Section 3.3 has detailed the evolution of the site from the historical information which is available.

The possible impact upon archaeological remains deriving from each of these events will be detailed below:

Demolition of the slaughterhouse and yards (c1858).

Very little is known about the exact layout and nature of the slaughterhouse and it is not known how thorough the demolition and cleansing of the site was at the time of demolition. An auction was advertised (e.g. in the Mercury on 27th May 1858:p3) for the building materials of the old slaughter house to be sold without reserve on the 11th June that year. Whether purchasers of materials removed subsurface remains

(e.g. foundations) is not known – but it is unlikely that the value of those materials would warrant exhaustive removal in the absence of machinery. With the trend of building up the land around the rivulet, it does not seem likely that the building was demolished to sub-surface levels and it is more likely that items of value from the superstructure would have been removed and the site filled. Nonetheless until further research (historical or archaeological) can determine detail of the demolition, then the possibility of substantial remains of the slaughterhouse and associated infrastructure should not be ruled out.

Construction of the row of houses facing Park Street (post 1880).

No detail on the construction of these houses could be found (i.e. pre-dating HCC building records). Again, it is assumed that there was a general desire in the area to build up land, particularly for residential buildings in close proximity to the rivulet, so it is likely that any underlying remains of the slaughterhouse and associated infrastructure may not have been disturbed by the construction (and later demolition) of these houses.

Demolition of all pre-1916 buildings and rivulet diversion (c1916-25)

When the Hobart City Council acquired the area in 1916 and commenced clearance for the redevelopment of the area, all buildings on each side of lower Collins Street were removed. Sources (e.g. Down Wapping) indicate that widespread filling of the area (e.g. spoil removed from tunnelling works) occurred, which is consistent with the archaeological evidence elsewhere in Wapping which (in some cases) indicates that over 1.5 metres of fill has been deposited above historic floor levels. Despite (presumably) a substantial labour-force at-hand for the rivulet diversion works, it is likely that filling of the site would have meant that shallow remains were buried rather than removed which may have acted to preserve archaeological remains of that early development (possibly dating back to the 1810s, and representing almost 100 years of residential, commercial and industrial occupation.

Construction of first Roberts building (1936 – now demolished)

Plans exist from the construction of the 1936 Roberts building which was mostly on top of the course of the former Domain/Park Street rivulet, on land becoming available after the rivulet diversion works. This was an extension of the c1926 Roberts building that fronted Macquarie Street, also built on a parcel of land arising from the diversion works. This shows widespread disturbance of the footprint, with substantial piling, pile capping and filling having occurred, as well as some filling to raise and level the site (which had probably already been raised as part of the c1916-25 rivulet diversion works). Two sewer mains were also installed at

that time (or had been installed earlier). Such extensive foundations were probably a response to the instability of the former rivulet bed and would have caused widespread disturbance of that part of the site. Demolition of that building in the latter half of the twentieth-century would have also caused disturbance.

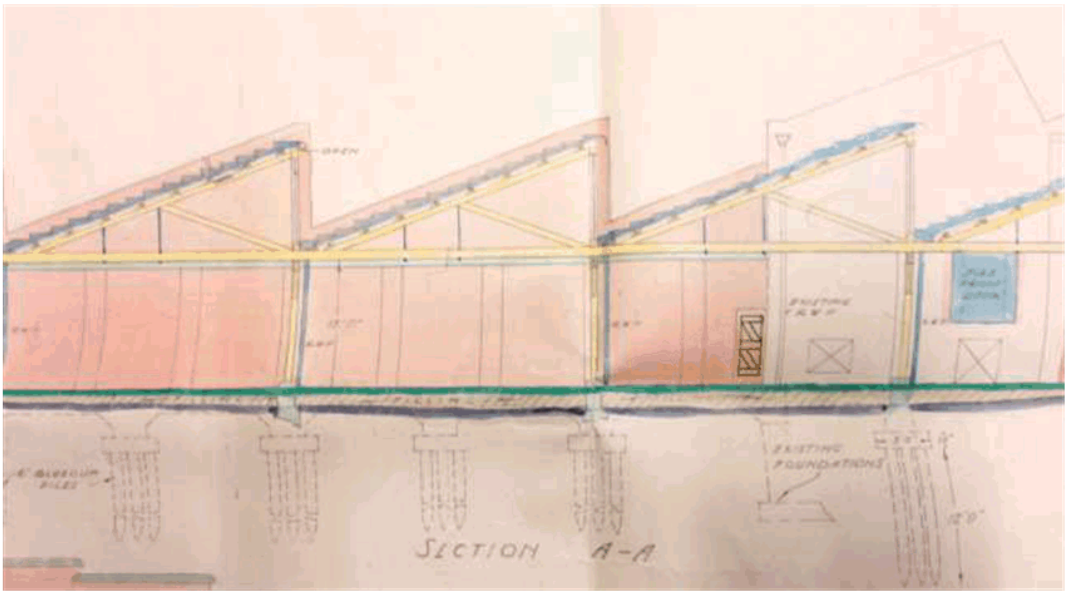

Figure 3.5.6 – Section through the 1936 Roberts building showing extensive piling but with substantial filling on top of the existing ground level. Tasmanian Archive and Heritage Office (HCC series) AE417//1924.

Construction of the current Roberts building (1958).

Prior to 1958 (and after 1946), the three houses and outbuildings fronting Park Street (Brooker Avenue) were demolished. Again, records do not indicate how thoroughly these buildings were demolished (and also noting that these were partially on the site of the slaughterhouse. It is presumed, however, that the site would have been filled to raise it to a level consistent with ground raising works undertaken from the 1910s onwards which may have resulted in foundations and other archaeological remains being undisturbed and covered by the new building. As per the description above, that building is largely clearspan (i.e. minimal internal walls), which may not have required extensive or deep foundations (plans for this building could not be located). This building is on a portion of the land which would have been more stable (i.e. not within the former course of the rivulet) which also suggests that foundations may not have been as intrusive as those of the adjacent c1936 building therefore may have caused less disturbance.

Subsequent service trenches etc.

A search of electricity, sewer, gas, telephone and other underground asset registers suggests that there are few major underground services within 2 Collins Street. The 1936 plans for the construction of the (now demolished) Roberts building shows two sewer mains running below that building (i.e. along the former line of the rivulet), however these do not show on current asset registers and may be redundant. Nonetheless, the installation of these would have caused disturbance along that line. Whilst there are likely to be a number of service lines throughout the site, given that there is likely to have been extensive filling across the site these may have only been excavated into that more modern (and non-significant) fill therefore may not have substantially impacted significant archaeological remains.

3.6. Archaeological zoning plan and policies

As per the methodology outlined in Section 3.1, this section has built a chronology of site development which has detailed the physical evolution of the site and events/processes which would have acted to build the archaeological record. Section 3.4 has discussed the likely significance of those archaeological remains and what they may yield in terms of research potential alongside key historic, regional, thematic and temporal lines of enquiry. Section 3.5 has provided an assessment of the events which are likely to have impacted upon the integrity of those archaeological remains.

From the above, it is therefore possible to formulate an archaeological zoning plan, which provides an indication of the parts of the site which are likely to yield significant archaeological remains. The spatial reference provided by the zoning plan can then be coupled with archaeological management policies, which are guided by the significance of the particular remains expected and their ability to yield information as per the research questions.

Figure 3.6.1 depicts the areas of archaeological potential as per the above discussion:

Figure 3.6.1 – Archaeological zoning plan, 2 Collins Street, Hobart. Colour coding as per table below.

Area	Likely remains	Likely integrity	Significance/potential
Blue	Domestic discard, underfloor deposits, structure, drains, paving etc. associated with post 1858 housing and 100 years of occupancy.	Likely to be reasonably intact, the only disturbance event being the demolition of those buildings and the c1958 construction of the current Roberts building. The building being largely laid out as a 'clear span' building and the likely filling of the site to build up the level is likely to have preserved remains.	Of some archaeological interest in demonstrating the evolution of the site and how the 'higher class' fringe of Wapping developed alongside the reinvigoration of the area resulting from the nearby railway station. Nonetheless, remains of 1870s+ buildings and occupational debris are not considered to be of the highest significance. Whilst it is likely that there are remains of these buildings and occupation deposits in this area, with the low level of significance of these remains it is concluded that these are of **low archaeological potential.** Note that as per below, deeper deposits in this area are likely to be of high archaeological potential.
	Possible ancillary structures and artifacts relating to the government slaughterhouse.	Unknown. The exact nature of any ancillary infrastructures relating to the slaughterhouse is unclear. It is also not known how thoroughly the site was demolished/cleansed prior to the post-1860 construction of the residences in this location. It is likely that the level of the site was built up following the demolition of the slaughterhouse and prior to construction of the residences which would act to preserve earlier archaeological remains.	Of high significance as Hobart's first large-scale meat processing facility and the government's attempt to regulate the meat industry. Until a more adequate knowledge is gained as to the integrity of any slaughterhouse remains, these remains must be considered to be of **high archaeological potential**.

Red	Domestic discard, underfloor deposits, structure, drains, paving etc. associated with post 1870 housing and ~80 years of occupancy.	Likely to be reasonably intact, the only disturbance event being the demolition of those buildings and the c1958 construction of the current Roberts building. The building being largely laid out as a 'clear span' building and the likely filling of the site to build up the level is likely to have preserved remains.	Of some archaeological interest in demonstrating the evolution of the site and how the 'higher class' fringe of Wapping developed alongside the reinvigoration of the area resulting from the nearby railway station. Nonetheless, remains of 1870s+ buildings and occupational debris are not considered to be of the highest significance. Whilst it is likely that there are remains of these buildings and occupation deposits in this area, with the low level of significance of these remains it is concluded that these are of **low archaeological potential.** Note that as per below, deeper deposits in this area are likely to be of high archaeological potential.
	Structure, artifacts and ancillary infrastructure relating to the actual footprint of the government slaughterhouse.	Unknown. The exact nature of the slaughterhouse is not known, although depicted as a masonry building. It is also not known how thoroughly the site was demolished/cleansed prior to the post-1870s construction of the residences in this location. It is likely that the level of the site was built up following the demolition of the slaughterhouse and prior to construction of the residences which would act to preserve earlier archaeological remains.	Of high significance as Hobart's first large-scale meat processing facility and the government's attempt to regulate the meat industry. Until a more adequate knowledge is gained as to the integrity of any slaughterhouse remains, these remains must be considered to be of **high archaeological potential**.

Green	Fill from the filling of the rivulet following drainage works c1916-25. Remains of infrastructure used to control the Domain/Park Street Rivulet (e.g. walls, channels etc.). Remains of the natural rivulet bed.	It is unclear what methods were used to fill the rivulet and how thoroughly any associated infrastructure was demolished. At least two sewer mains are shown on the 1936 plans for the Roberts building which would have impacted the integrity of this part of the site. The foundations of the Roberts building were substantial (probably necessitated by the less stable rivulet bed) which would have further impacted upon any archaeological remains.	Whilst there may be some artifacts (discard/fill) and ancillary structures of archaeological interest and/or relating to other themes across the site/area in this area, and insights into filling methods may be of some value for understanding site formation processes across the site, this area is likely to have been highly disturbed and of low significance in any case. Overall, this area is considered to have **low archaeological potential.**
Yellow	Area where there appears to have been little/no historical development (i.e. yard space).		Although there were no known buildings in this area, proximity to such an intensively utilised area means that there may be significant artifacts (discard/fill) and ancillary structures of archaeological interest and/or relating to other themes across the site/area. There is also the possibility that this area may have remains of undocumented buildings. Overall, this area is considered to have **medium archaeological potential.**

Orange	Remains of early residential development (pre-c.1819) and the woolstapling and fellmonger businesses.	These remains are likely to be largely intact, with only a single phase of development occurring post their demolition (c1925) and a high likelihood that extensive filling of the site was undertaken post-demolition of the earlier buildings. That development pre-dates mechanical excavation and the large and relatively open nature of that building, coupled with filling to level the site and bring it to the new street level is likely to have had minimal archaeological impact and acted to preserve underlying remains.	Of high significance as representing an early area of residential development in the Wapping (and general city fringe) area. Also of high significance as an early and long-running colonial industry. Overall, this area is considered to have **high archaeological potential.**

Accordingly, the following archaeological management policies are recommended:

1. Any excavation proposed in areas of **high archaeological potential** must be preceded by an archaeological impact assessment, and if necessary an archaeological method statement, which details measures to be taken to avoid or mitigate impact upon the archaeological resource. That method statement must be in accordance with industry standard (e.g. the Tasmanian Heritage Council's Practice Note 2 – *Managing Historical Archaeological Significance in the Works Application Process*) and implemented in the works process.

2. Any excavation in areas of **moderate archaeological potential** must be monitored by a qualified historical archaeologist, and if any significant remains (as guided by the commentary on expected remains above) are encountered, then these must be dealt with in accordance with industry standard (e.g. the Tasmanian Heritage Council's Practice Note 2 – *Managing Historical Archaeological Significance in the Works Application Process*).

   Note that works as per above are likely to require a development application to Hobart City Council, who will assess the acceptability of the approach to archaeology as part of the development appraisal process.

3. Generally, no archaeological input is required for excavation in areas of **low archaeological potential**, however any unexpected finds must be reported to a qualified historical archaeologist who is to assess their significance and deal with any significant finds as per (1) and (2) above. There is merit in an archaeological inspection of initial excavation in this area in order to refine archaeological judgments and to broadly document site formation processes in that area (e.g. rivulet filling/diversion). If it is found that this area has a higher than expected archaeological potential, then that part of the site is to be dealt with as per the provisions for high or medium archaeological potential at the discretion of the archaeologist.

4. Where possible, the preference is to not disturb archaeological remains, however it is acknowledged that the feasible redevelopment of the site may not be possible without doing so. Consideration should be given to any development design to minimise potential impact, however if this is not feasible the above policies (and implementation of method statements pursuant to those policies) are considered sufficient to yield the archaeological potential of the site. An archaeologist should be

included in the project design team in order to manage archaeology as part of an iterative process between the client, archaeologist, designer(s) and permit authorities.

5. Consideration should be given in any redevelopment of the site to incorporate archaeological remains (e.g. as interpretation) however this should not inhibit the feasible redevelopment of the site.

6. A test-trenching program, or geophysical investigations may be employed to refine the archaeological judgments outlined in this document and to better guide the design and implementation process (note that test-trenching may require development approval).

7. All results from any archaeological work on the site should be made widely available in order to support the ongoing research of the Wapping area (and wider Hobart/early Tasmania)

4. Archaeological Impact Assessment

A proposal has been formulated by S Group Architecture (Launceston) for a large mixed-use development of the subject site. The proposed project is detailed on drawings *Collins St, A01-09* (22/08/2016) and of particular relevance to archaeological management the *Proposed Footing Zones* drawing by Gandy and Roberts Consulting Engineers (Drawing 16.0253 SK100 Rev P1), as per Figure 4.1 below).

Figure 4.1 – Indicative footing plan, (Gandy and Roberts Drawing 16.0253 SK11 Rev P1). Note that the colour coding on this figure does not relate to archaeological zoning.

The following 'categories' of excavation/possible archaeological impact are considered here, with responses to each formulated in Section 5 (archaeological method statement):

4.1. Wide, but shallow clearance across the site.

Insofar as ground disturbance, the project proposes that the site will be cleared of all current buildings, paving, services etc. generally do a depth not exceeding 500mm (with the exception of current building footings and services). It is expected that this level of clearance will only be into modern and non-significant fill, which the SoHAP has predicted to be anything up to two metres in depth. Section 5 proposes a strategy for confirming the depth and likely extent of such fill in order to verify the expectation that shallow but wide excavations will have no archaeological impact and that similarly the excavation of components of extant buildings and current services will also have no archaeological impact. If the depth and extent of fill is less than predicted (i.e. if site clearance might be expected to reach levels of significant archaeological remains), then the archaeological method statement will propose strategies to manage that impact.

4.2. Excavation for pile caps and drilling for piles.

The foundation system for the proposed building is intended to be a series of piles, drilled and/or driven to bedrock upon which each array of piles will have a pile cap. As per the Gandy and Roberts drawing, it is proposed that there will be 21 of these pile arrays and caps, each 3.0mx3.0m by 1.5 metres deep (cap depth), plus another 7 larger arrays and caps each 3.0m x 7.0m. These pile arrays will therefore require disturbance of around 336 square metres of the site (approximately 11% of the total site area).

Depending on the location of these pile arrays, they are likely to have some archaeological impact. The base cap will be 1.5 metres deep, plus an additional depth required for the ground floor, which, depending on fill levels, may reach significant archaeological layers.

The following Table considers whether the location of each of these pile arrays is likely to have any archaeological impact and the archeological remains possibly encountered. In the absence of complete broadscale excavation of the site, it is not considered feasible to plan pile locations to avoid archaeological remains. Even if that approach was feasible, it may not be possible to do so without substantial disruption to the structural specifications and layout of the proposed building, therefore it is considered a more

pragmatic approach to concede that the drilling/piling process *will* have unavoidable impact and that mitigation strategies are the most prudent way of addressing that impact.

Archaeological input into the actual drilling/piling process is somewhat futile – given that the drilling for the piles essentially cuts through and destroys the archaeological resources before any inspection can be made. Whilst spoil can be inspected, the differentiation between fill and in-situ archaeological remains, once drilled, is practically impossible to differentiate.[4] Accordingly, the archaeological method statement acknowledges that no meaningful archaeological data can be yielded from those works and proposes other mitigation strategies to yield archaeological potential as part of the overall site development process. Archaeological input into the excavations for the pile caps, however, is a method which can yield archaeological data between the basal depth of non-significant fill and the base level of the pile cap, which is further detailed in Section 5.

4.3. Excavation for other deep structures (e.g. lift bases etc.).

As well as the pile arrays, the scheme proposes a number of excavations required for lift and crane foundations and overrun shafts. Three smaller lift/stair bases are proposed, each approximately 4.0x4.0 metres and require excavation to 2.0 metres (plus floor depth). The main lift area (and crane base) required a foundation approximately 15.0 x 15.0 metres to 3.0 metres depth (plus floor depth). Combined, these areas therefore constitute disturbance to approximately 237 square metres (approximately 9% of the total site area). In addition, a series of strip footings to a depth of 1.0 metre (plus floor depth) – one running perpendicular off the Collins Street frontage and another running the length of both Ragged Lane and the boundary of the site and the Old Woolstore. These footings are proposed to be approximately 1.5 metres wide and with an overall (combined) length of 140 metres, which constitutes approximately 210 square metres of the site (approximately 7% of the total site area).

As per the excavation required for the pile caps, these excavations have the potential to impact upon archaeological remains, however do offer the opportunity for archaeological input as part of the works process to yield archaeological potential and mitigate such impact.

[4] Note that the cores from geotechnical investigations undertaken by Scherzic on the site in early 2015 were archaeologically inspected which were completely inconclusive from an archaeological perspective given the inability to differentiate between fill, rubble and in-situ archaeological remains.

4.4. Obscuring the preserved archaeological remains

Aside from the excavations required to facilitate the proposed development, another consideration arising from the development is that the proposed almost total site coverage which will essentially obscure the ability to investigate the archaeological resource of the site during the life of that building. Noting that the excavations described above constitute only around 27% of the total site area, there is likely to be a vast amount of archaeological remains which are not disturbed. Given the high degree of archaeological potential of the site, coupled with the extent of work which has been done across the Wapping area over the last 20 years, it is considered that the obscuring of the ability to investigate this site is an impact which will arise from the proposed development. Conversely, it could also be argued that the fact that the building will essentially 'seal' a large proportion of the archaeological resource with minimal disturbance that a positive outcome for 'future archaeology' can be achieved.

It is considered that the proposed archaeological program detailed in Section 5 provides a very good sampling of the archaeological themes of the site, yielding some of the archaeological potential of the site, whilst the remaining potential will be left in-situ.

The following Figures depict the proposed excavation locations in relation to the areas of archaeological potential, and more specifically likely building (and other feature) footprints as per Section 3.3:

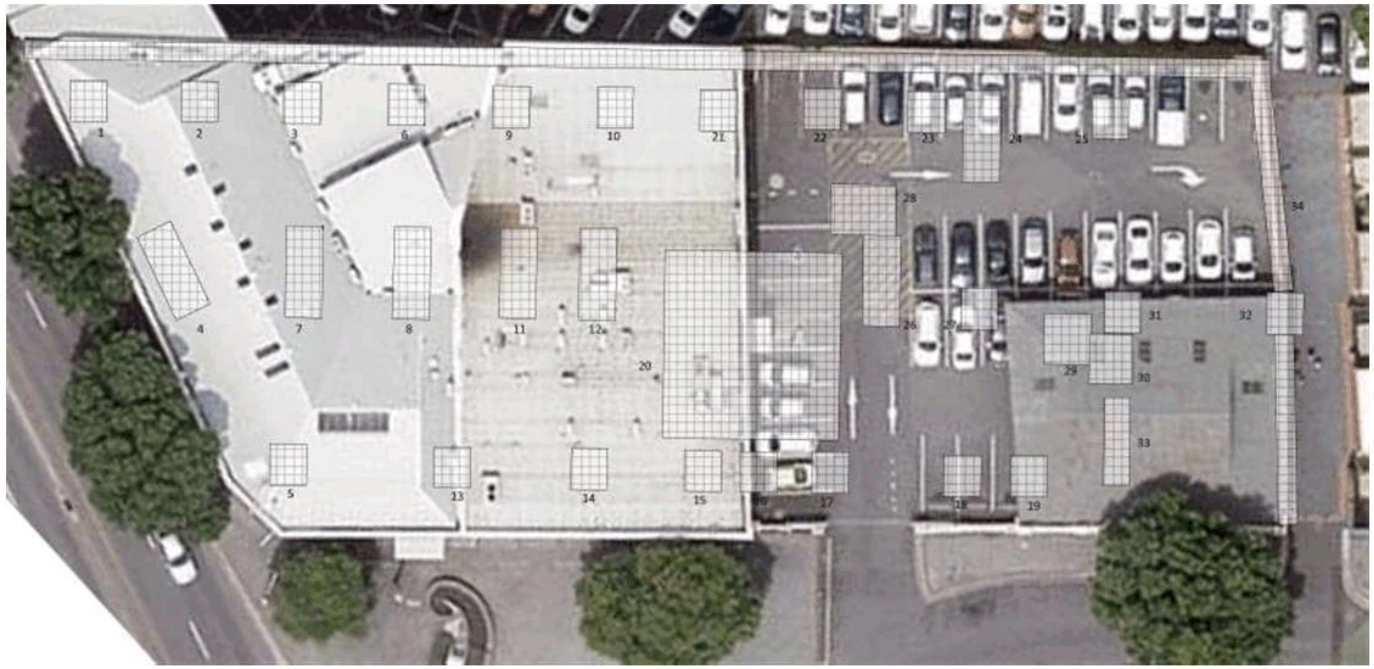

Figure 4.2 – Overlay of the proposed excavation areas (hatched) as per Figure 4.1 over a recent aerial photograph (GoogleEarth).

Figure 4.3 – Archaeological zoning plan for 2 Collins Street – Blue – 1860s residential, Red – 1860s residential over 1820s slaughterhouse, Green – rivulet and disturbed area, Yellow – Historical yardspace, Orange – Pre 1820s+ residential and commercial development. See expanded definitions of these colour codes on pp68-71.

Figure 4.4 – Overlay of the footprint of the pre1827 buildings (light blue) in relation to the proposed excavation areas (hatched) – drawn from the 1827 Sharland survey.

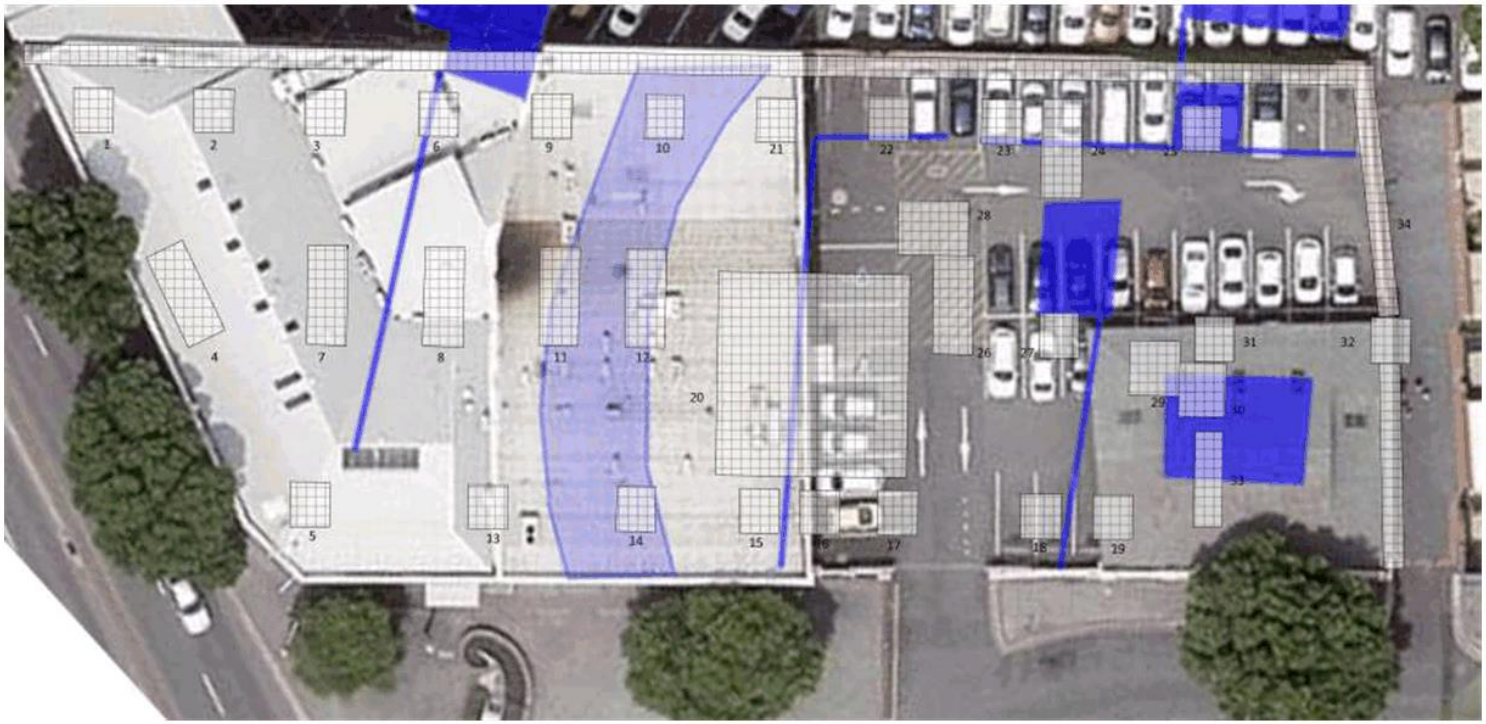

Figure 4.5 – Overlay of the footprint of the pre1830 buildings (blue) in relation to the s proposed excavation areas (hatched) – drawn from the c1830 survey.

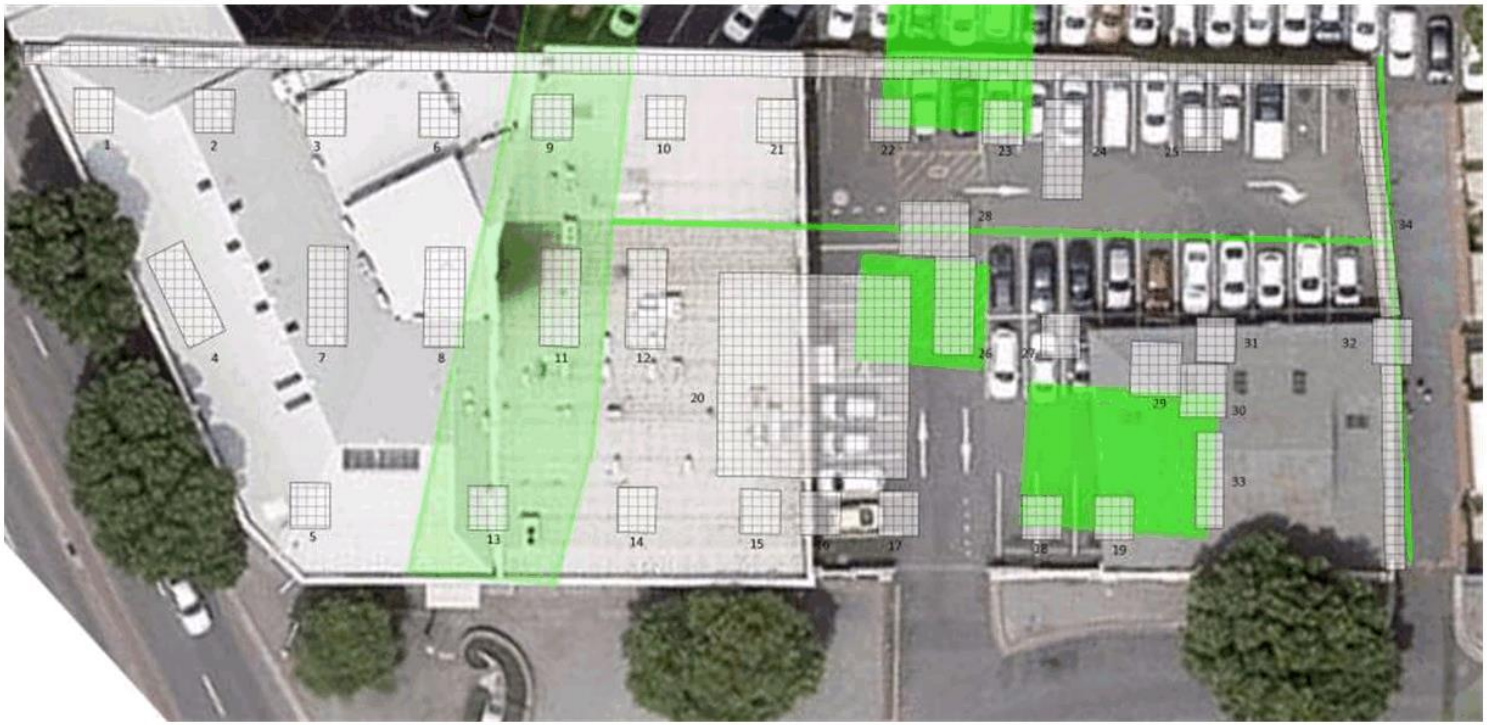

Figure 4.6 – Overlay of the footprint of the pre1839 buildings (green) in relation to the proposed excavation areas (hatched) – drawn from the 1839 Frankland Survey.

Figure 4.7 – Overlay of the footprint of the pre1841 buildings (yellow) in relation to the proposed excavation areas (hatched) – drawn from the 1841 Census map.

Figure 4.8 – Overlay of the footprint of the pre1841 buildings (orange) in relation to the proposed excavation areas (hatched) – drawn from the 1841 Sprent map.

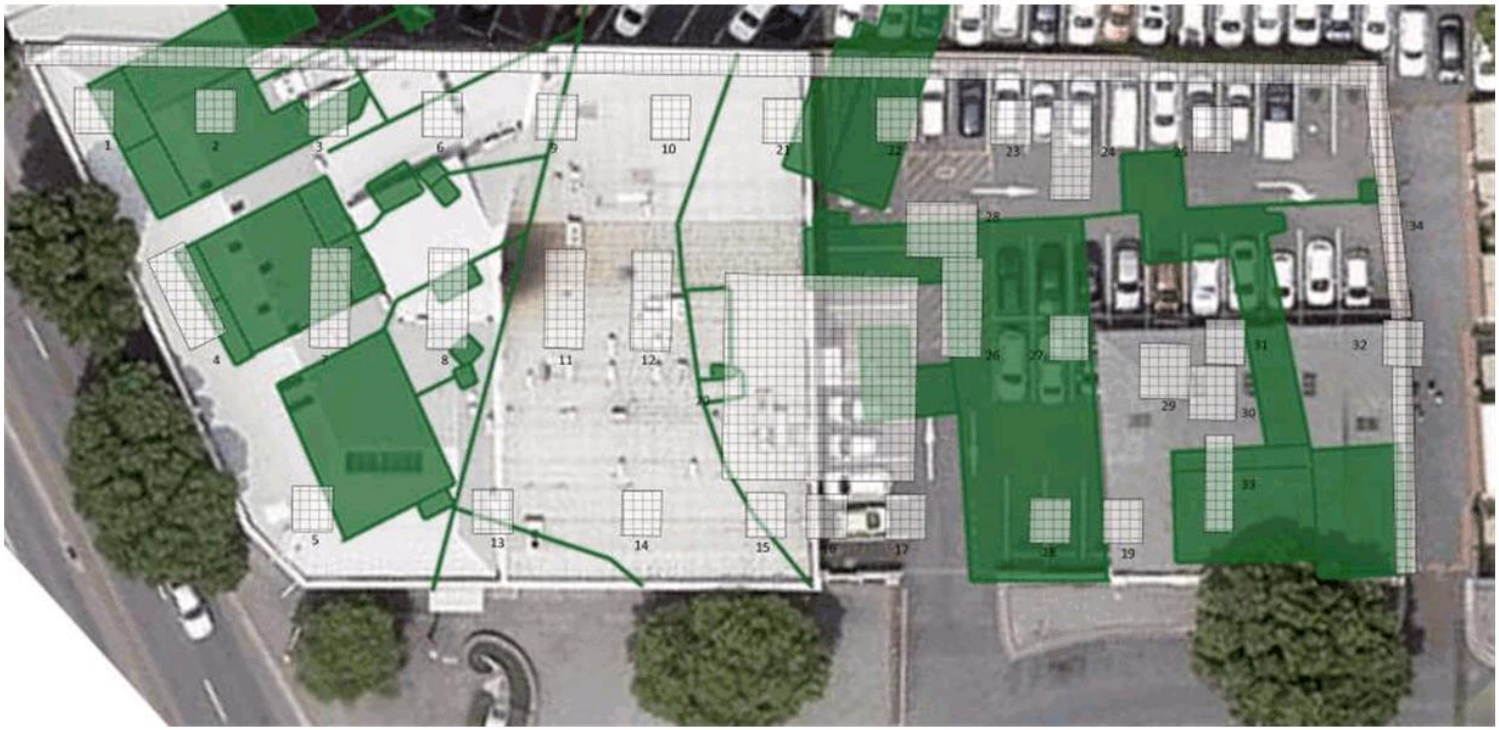

Figure 4.9 – Overlay of the footprint of pre 1910 buildings (dark green) in relation to the proposed excavation areas (hatched). From the 1910 HCC rivulet diversion plan.

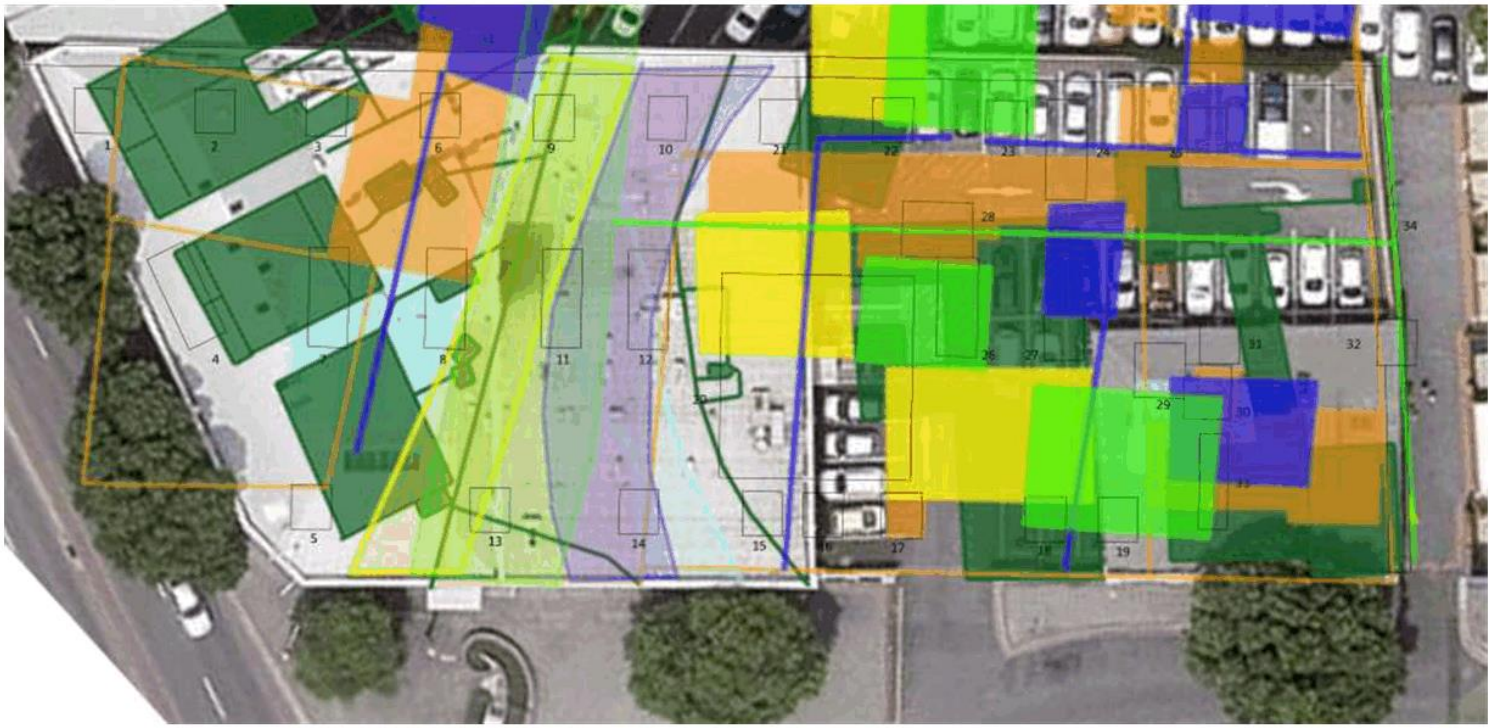

Figure 4.10 – Composite overlay of the footprint of all known pre-1910 buildings and site features (colours as per coding above) in relation to the proposed excavation areas (outlines only – numbers refer to the table below).

The following table lists each excavation area (as numbered on the above Figures) and considers the likely potential and significance of each area and the possible impact arising from the proposed development. Note that the statements of possible impact below are based on the assumption that the site has 1-2 metres of non-significant fill across it – these statements may need to be revised should additional information on the nature, extent and variability of that fill come to hand (e.g. through test trenching or initial trenching).

The terminology relating to significance used here has been derived from Section 3.4, whilst the following terminology has been used here to describe impact:

High: Where the proposed development is likely to impact all or most of that feature, or a smaller portion of a feature of high significance.

Medium: Where the proposed development is likely to intersect that feature, but only a small portion of it.

Low: Where the proposed development is not likely to reach the depth of the feature or be likely to be clear of the footprint.

This table is to be read in conjunction with Figure 4.10, which shows the likely physical location of particular site features, as well as Figure 4.3 and explanatory definitions on pp.68-71 which details the archaeological zoning for the site:

Area	Excavation for	Dimensions (length x breadth x depth) (metres)	Area of potential	Specific site	Possible impact
1	Pile cap	3.0x3.0x1.5	Domestic discard, underfloor deposits, structure, drains, paving etc. associated with post 1858 housing and 100 years of occupancy. Likely high integrity but low archaeological potential and significance. Possible ancillary structures and artifacts	On the edge of the footprint of a post-1858 house as per the 1910 survey and 1946 aerial photo.	Low impact on a feature of low significance.
2				Within the footprint of a post-1858 house as per the 1910 survey and 1946 aerial photo.	Medium impact on a feature of low significance.

			relating to the government slaughterhouse. Integrity unknown. Likely high integrity, significance and archaeological potential (subject to a better understanding of disturbance of earlier remains).		
3				Within the footprint of a post-1858 domestic outbuilding as per the 1910 survey and 1946 aerial photo.	Medium impact on a feature of low significance.
4		7.0x3.0x1.5		On the edge of the footprint of a post-1858 house as per the 1910 survey and 1946 aerial photo.	Low impact on a feature of low significance.
5		3.0x3.0x1.5		Wholly inside the footprint of the slaughterhouse as per the 1843 Sprent survey). On the edge of the footprint of a post-1858 house as per the 1910 survey and 1946 aerial photo.	High impact upon a feature of high significance.
6			Domestic discard, underfloor deposits, structure, drains, paving etc. associated with post 1870 housing and ~80 years of occupancy. Likely high integrity but low archaeological potential and significance. Structure, artifacts and ancillary infrastructure relating to the actual footprint of the government slaughterhouse. Likely high integrity, significance and archaeological potential	Intersected by a wall on the c1830 survey.	Medium impact on a feature of medium significance.
7		7.0x3.0x1.5		Almost wholly inside the footprint of the slaughterhouse as per the 1827 Sharland survey. Within the footprint of a post-1858 house as per the 1910 survey and 1946 aerial photo.	High impact upon a feature of high significance.
8				Wholly inside the footprint of the slaughterhouse as per the 1827 Sharland survey.	High impact upon a feature of high significance.

				Partially inside the footprint of the slaughterhouse as per the 1843 Sprent survey). Within the footprint of a post-1858 domestic outbuilding as per the 1910 survey and 1946 aerial photo.	
9		3.0x3.0x1.5	Fill from the filling of the rivulet following drainage works c1916-25. Remains of infrastructure used to control the Domain/Park Street Rivulet (e.g. walls, channels etc.). Remains of the natural rivulet bed. Likely to be highly disturbed and of low archaeological potential.	On most early maps, within the course of the rivulet and or dissected by rivulet walls.	Low impact upon features likely to be highly disturbed.
10					
11		7.0x3.0x1.5			
12					
13		3.0x3.0x1.5			
14					
15			Area where there appears to have been little/no historical development (i.e. yard space). Probably low disturbance therefore of medium archaeological potential as the area may yield remains of undocumented buildings and activities related to a very early developed part of the site.	Distinctly intersected by a rivulet wall on the 1910 survey.	Low impact on a feature of low significance (and/or highly disturbed).
16				No specific features shown on any historic map in this area despite likely intensive use of this area.	Unknown impact upon an area of medium significance, largely because that area is poorly documented.
17				Wholly inside the footprint of an unknown building as per the 1843 Sprent survey). Just on the edge of an unknown building as per the 1841 census map.	High impact upon an area of high significance.
18				Just on the edge of an unknown building as per the 1841 census map and the 1839	Medium impact upon an area of high significance.

				Frankland survey. Partly within the footprint of an unknown pre-1910 building.	
19				Partly within an unknown building as per the 1839 Frankland survey.	Medium impact upon an area of high significance.
20	Lift/stair core and crane base	Approx 15.0x15.0x3.0	(straddles the areas described in 15-19 and 21-32)	Partly inside the footprint of two unknown buildings (possibly the fellmongery and a domestic building) as per the 1841 census map (one of those buildings shown on the 1839 Frankland survey). Notably absent of development on the 1843 Sprent survey. Intersected by a wall on the c1830 survey. Partly within the footprint of an unknown pre-1910 building.	The southern and eastern edges of this area are probably the most likely to have features of high significance upon which the proposal will have high impact. The remainder of this area is poorly documented historically and a very early settled area which is of medium significance and the proposal will have high impact.
21	Pile cap	3.0x3.0x1.5	Remains of early residential development (pre-c.1819) and the woolstapling and fellmonger businesses. Likely high integrity, significance and archaeological potential. Significant remains likely to be deeply buried in fill (possibly up to 2.0 metres deep).	Partly within the footprint of an unknown pre-1910 building.	Medium impact on a feature of medium significance.
22				Partly inside the footprint of an unknown building (possibly the fellmongery) as per the 1841 census map and the Frankland 1839 survey. Intersected by a wall on the c1830 survey.	Medium impact upon an area of high significance.

				Partly within the footprint of an unknown pre-1910 building.	
23				Partly inside the footprint of an unknown building (possibly the fellmongery) as per the Frankland 1839 survey. Intersected by a wall on the c1830 survey.	Medium impact upon an area of high significance.
24		7.0x3.0x1.5		Wholly inside the footprint of an unknown building as per the 1843 Sprent survey (probably the fellmongery). Intersected by a wall on the c1830 survey.	High impact upon an area of high significance.
25		3.0x3.0x1.5		Partly inside the footprint of an unknown building as per the c1830 survey and 1843 Sprent survey (probably the fellmongery)	Medium impact upon an area of high significance.
26		7.0x3.0x1.5		Wholly inside the footprint of an unknown building (possibly the fellmongery) as per the Frankland 1839 survey. Partly within the footprint of an unknown pre-1910 building.	High impact upon an area of high significance.
27		3.0x3.0x1.5		Partly within the footprint of an unknown pre-1910 building.	Low impact on a feature of medium significance.
28	Lift base core	Approx 5.0x6.0x2.0		Wholly inside the footprint of an unknown building as per the 1843 Sprent survey (probably the fellmongery). Partly within the footprint of an unknown pre-1910 building.	High impact upon an area of high significance.
29		Approx 4.0x4.0x2.0		Just on the edge of an unknown building as	Medium impact upon an area of high

				per the 1827 Sharland, c1830 and 1839 Frankland surveys.	significance.
30				Partly inside the footprint of an unknown building as per the 1827 Sharland, c1830 survey, the 1843 Sprent survey and 1839 Frankland survey (possibly domestic)	Medium impact upon an area of high significance.
31	Pile cap	3.0x3.0x1.5		No specific features shown on any historic map in this area despite likely intensive use of this area.	Unknown impact upon an area of medium significance, largely because that area is poorly documented.
32				No specific features shown on any historic map in this area despite likely intensive use of this area.	Unknown impact upon an area of medium significance, largely because that area is poorly documented.
33	Strip footing	Approx 7.0x2.0x1.0		Partly inside the footprint of an unknown building as per the 1827 Sharland, c1830 survey, the 1843 Sprent survey and 1839 Frankland survey (possibly domestic). Partly within the footprint of an unknown pre-1910 building.	Low impact on a feature of high significance.
34		Approx 2.0 wide, 1.0 deep, running the entire Ragged Lane and Woolstore boundaries	Crosses the edge of all of the above areas.	Cuts through the footprint of the government slaughterhouse and another (unknown) building as per the c1830 and 1843 Sprent surveys.	Low impact on features of high significance on the line of wall running along the Woolstore boundary (excluding the 'Rivulet' area).

Given that the above table has considered the significance of the archaeological resource (closely linked to their archaeological potential) and the likelihood that the proposed development will impact a number of areas of different significance to different degrees, the following matrix broadly details the level of archaeological input deemed to be required to mitigate that impact, which will be further detailed in Section 5:

	Impact		
Significance	High	Medium	Low
High			
Medium			
Low			

Accordingly, the following colour code has been adopted to consider significance in-light of the integrity of that particular element:

- **Red –** Controlled archaeological investigation required ahead of the works program.
- **Orange** – Either controlled archaeological investigation required ahead of the works program, or archaeologically controlled monitoring of the works program.
- **Green** – Post excavation inspection, with call-in provision for unexpected finds.
- **Blue** – No archaeological input required.

Again note that the predicted impact is likely to require review once a better understanding of the depth, extent and variability of non-significant fill across the site is known.

5. Archaeological method statement

As detailed in Section 4, the proposed development is expected to have impact upon significant archaeological remains in approximately 20 locations across the site – constituting around 20% of the site area. With the exception of the main lift/crane foundation (i.e. 20) and the major strip footing (i.e. 34), these areas are limited to (generally) 3.0x3.0 metre and 3.0x7.0 metre areas which essentially are a sampling across the entire site. Each of these will be approached from a practical sense as individual excavations designed to respond to the practical works need, but also to contribute to the research questions set in Section 3.4. Whilst individual research questions have not (at this stage) been set for each of these areas, the general questions detailed in Section 3.4, coupled with the (as yet) known nature of the remains as detailed in the Table in Section 4, provides a framework within which each area will be approached – with the post-excavation analysis further refining research questions and contextualising the results.

As per Section 4, the 34 areas proposed for excavation have been provided with a colour code which summarises the level of archaeological input required, namely:

- **Red –** Controlled archaeological investigation required ahead of the works program.
- **Orange** – Either controlled archaeological investigation required ahead of the works program, or archaeologically controlled monitoring of the works program.
- **Green** – Post excavation inspection, with call-in provision for unexpected finds.
- **Blue** – No archaeological input required.

5.1. Approach to works

Site setout

A surveyor will be engaged to undertake the site setout, as required by the construction contractor. As the archaeological program is essentially works driven, archaeological investigations will only be undertaken where essential for the facilitation of the development.

Removal of current paving/flooring

Concrete and asphalt will be cut from each area of investigation and removed by mechanical excavator. Note that some areas are intersected by the walls of extant buildings – in these cases investigation may need to occur after demolition and prior to the overall works program (e.g. as part of an early works package).

Removal of non-significant overburden

Initially, an archaeologist will supervise the mechanical excavation of any non-significant overburden (e.g. fill, demolition rubble etc.) until such a point where any significant in-situ archaeological remains are encountered, then excavation will cease until an understanding of the nature of the remains is ascertained. This is expected to be substantial in some, if not all areas. Trenches must be shored when deeper than 1.5 metres. If no significant archaeological remains are encountered (to a depth of sterile ground level) then the provisions of 'cessation of archaeological input' (below) will be implemented and the SoHAP reviewed (considered unlikely in this instance unless disturbance is more substantial than predicted).

Where significant archaeological remains are encountered

In areas where significant archaeological remains are encountered, those areas will be gridded in an appropriate scale for horizontal control, and excavation will continue by hand (as per methodology below), to expose the remains in order to gain further understanding of their nature, and to thoroughly record them (as per methodology below). Mechanical excavation in those areas will only continue if the archaeologist is satisfied that this can occur without detriment (or if it is possible given the likely required depth of trenches) and that required outcomes can be achieved and that excavation by hand is not necessary.

The general approach to excavation will be by gridding the area in units which are responsive to the nature of the remains (e.g. in horizontal control units no greater than 1000x1000mm in areas where remains appear to be complex or concentrated, or in larger control units where remains are not as complex or concentrated) and removal of each contextual unit or spit (in depths as deemed appropriate by the archaeologist, according to the nature of the strata and/or remains). Apart from non-significant overburden and demolition debris, all spoil will be sieved through mesh of a gauge no greater than 12mm and any significant artifacts managed as per below.

It is expected that the stratigraphic sequence will still be relatively simple, that of post demolition (possibly including some disturbance), demolition, occupation (which may include several distinct phases including habitation and construction) and that of pre-construction (natural ground) – noting that some areas are likely to include at least two major distinct construction/occupation/demolition phases (e.g. slaughterhouse and residential). Excavation of remains within the defined contexts in reverse order of deposition will occur and each unit/context thoroughly recorded (as per below) prior to removal and investigation below that level.

As the archaeological program is responsive to the technical specifications of the footing layout of the site, it is not considered feasible to retain any of these archaeological features in-situ (except very deep features, i.e. below pile caps and which may be avoided by piles), therefore all archaeological remains which are within areas required for excavation to facilitate the development will be removed. Note that the areas to be excavated represent only around 20% of the total site area, therefore a substantial representative sample of archaeological remains will be retained beneath the development.

Cessation of archaeological input

Archaeological input will cease only when the archaeologist is satisfied that all significant remains have been investigated and thoroughly recorded, as per this method statement and any conditions of statutory approvals, or if sterile ground is encountered, and that adequate consultation has been undertaken with Hobart City Council's Heritage Officer to verify that all on-site archaeological requirements have been met (and archaeological conditions satisfied).

Recording

Any structure or significant cultural deposit encountered will be thoroughly recorded (both photographically and sketched at a scale of no smaller than 1:20, and plotted on the site plan at a scale of a scale no smaller than 1:200). The first preference will be to keep structural remains in-situ (and covered in geo-fabric, unless removal is necessary to further investigate lower strata (which may bear archaeological remains), or if there is no prudent and feasible alternative to removal to allow the development to proceed – in which case remains will be removed after thorough recording.

Artifacts

Any significant artifacts found during excavations will be retained, and have the required in-field conservation treatments and packaging undertaken. Artifacts will be bagged and tagged with spatial identification, and removed from the site (to a secure location) daily. Trench-notes will further detail the context and initial interpretation of artifacts.

Basic post-field curation of artifacts will be undertaken. Glass and ceramic items will be washed, whilst any organics or metals will be dry-brushed. Artifacts will be packaged in acid-free archive bags, tagged with appropriate tags, and boxed in archival quality boxes (with appropriate padding if required). Should any urgent conservation treatment be required, a professional Conservator will be consulted at the earliest possible instance. A detailed catalogue of artifacts will be included in the final report on works.

After any required analysis, these will be archived (with a copy of relevant reports) on-site of the new development (upon completion) – however at the owner's discretion and with the approval of Hobart City Council's Heritage Officer, alternative arrangements for storage and longer term curation/display may be made with an appropriate repository.

Reporting requirements

Excavations and monitoring must be recorded to appropriate professional standards (for example Section 4.2 of the Tasmanian Heritage Council's Practice Note 2). A final report must include (at a minimum):

- An executive summary of findings
- Details of the methodology employed
- Detailed interpretations of findings
- Relevant annotated photographs
- Site plans at a scale of no less than 1:200
- Trench plans at a scale of no less than 1:50
- Feature plans/sketches at a scale of no less than 1:20
- Photograph log

A copy of the final report, and project archive, will be deposited with Hobart City Council within 6 months of completion of the excavations.

Public benefit

It is not proposed that any public benefit program be implemented as part of the test trenching program, however it is proposed that an interpretation plan for the site will be developed which will incorporate archaeological findings with the overall site history to communicate the key historic and archaeological themes of the site to future users. The final report will be made publicly available, through appropriate repositories such as Hobart City Council, Heritage Tasmania and the State Library of Tasmania and archaeological research (by others) using the archaeological findings will be encouraged.

Aboriginal heritage

The SoHAP and this test trenching proposal deals solely with the management of historic cultural heritage, and has not considered Aboriginal cultural heritage. As some excavation is likely to occur in ground below the historic layer, there may be the chance of encountering Aboriginal cultural heritage. There is also the possibility of encountering Aboriginal heritage in a secondary context (e.g. fill, or post-contact-period deposition). Archaeological monitoring should be mindful of this possibility, and pursuant to s.14 of the Aboriginal Relics Act 1975, any Aboriginal heritage encountered should be immediately reported to the Tasmanian Aboriginal Heritage Office, and works in that particular area cease until instructions for that office are received. Critical timeframes must be mindful of this possibility, and have contingencies for downtime accordingly.

Site contamination

It is the responsibility of the proponent of the development to investigate the possibility of site contaminants, and to either verify that no site contaminants are present, or to take required measures to deal with any known or likely contaminants during excavation works (noting that any necessary decontamination works may require archaeological input).

praxisenvironment

heritage

planning

archaeology

po box 338
north hobart
tasmania 7002

0418 303 184
info@prax.com.au

Adjacent Heritage Places – Conservation Policy

2 Collins Street

HOBART TASMANIA

Brad Williams

Heritage Consultant

For Fragrance Tas. Hobart Pty. Ltd.

September 2016

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This document was written by Brad Williams (BA.Hons Archaeology, G.Dip Maritime Archaeology, MA Cultural Heritage Management) Historical Archaeologist, Heritage Consultant and Director of Praxis Environment.

Unless otherwise stated, the north point (or approximate) of maps and plans is to the top of the page.

Cadastral information depicted in this document must not be relied upon without verification by a Surveyor.

1. Introduction and executive summary

This report has been commissioned by Fragrance Tas Hobart (Collins) Pty. Ltd., in order to inform the design process for a proposed redevelopment of 2 Collins Street, Hobart. The site currently comprises of a c1958 store, warehouse and office building (formerly Roberts), a large open former workshop and façade (formerly a garage) and a ground-level carpark area. Figures 1.1-1.2 depict the area which is subject to the proposed works, which comprises the subject site, a portion of a 3009 square metre site comprising of Certificate of Title 121603/1, on the north-eastern fringe of the Hobart CBD.

Figures 1.1-1.2 depict the area which is subject to the proposed works, which comprises the *subject site*.

The subject site is not listed on Table 1 (Places of Cultural Significance) of Part 22 of the Sullivans Cove Planning Scheme 1997 therefore the provisions of Part 22.4 (Conservation of Places of Cultural Significance) do not apply.

By the definition of 'Adjacent' in Part 22.3 of the SCPS97, the subject site is adjacent to 7 Macquarie Street (former Roberts Woolstore – façade facing Macquarie Street and Brooker Avenue only) and 18-26 Collins Street (former HCC/City Motors garage – façade only) which are both listed on Table 1 of Part 22 of the SCPS97.[1] Accordingly, any development of the subject site would be subject to the provisions of Part 22.5 of the scheme (which considers possible impact upon adjacent heritage places).

Accordingly, the brief for this project was:

- To identify the responsibilities arising from the adjacency to the above places.
- To provide conservation policy likely to be acceptable to the provisions of Part 22.5 of the scheme to guide the design process for development of the subject site.
- Once the conservation policy has been responded to in the design process, to undertake a heritage impact assessment against the conservation policy.

[1] Note that Figure 5 of the scheme (reproduced in part here as Figure 2.2) indicates a 'Place 20' (being the former Motor Registry building at 1 Collins Street) which has now been demolished – the listing has been removed from Part E, Table 1 but not from the Figure – it is therefore taken that 1 Collins Street is therefore not to be considered as an 'adjacent place' requiring consideration against Part 22.5.

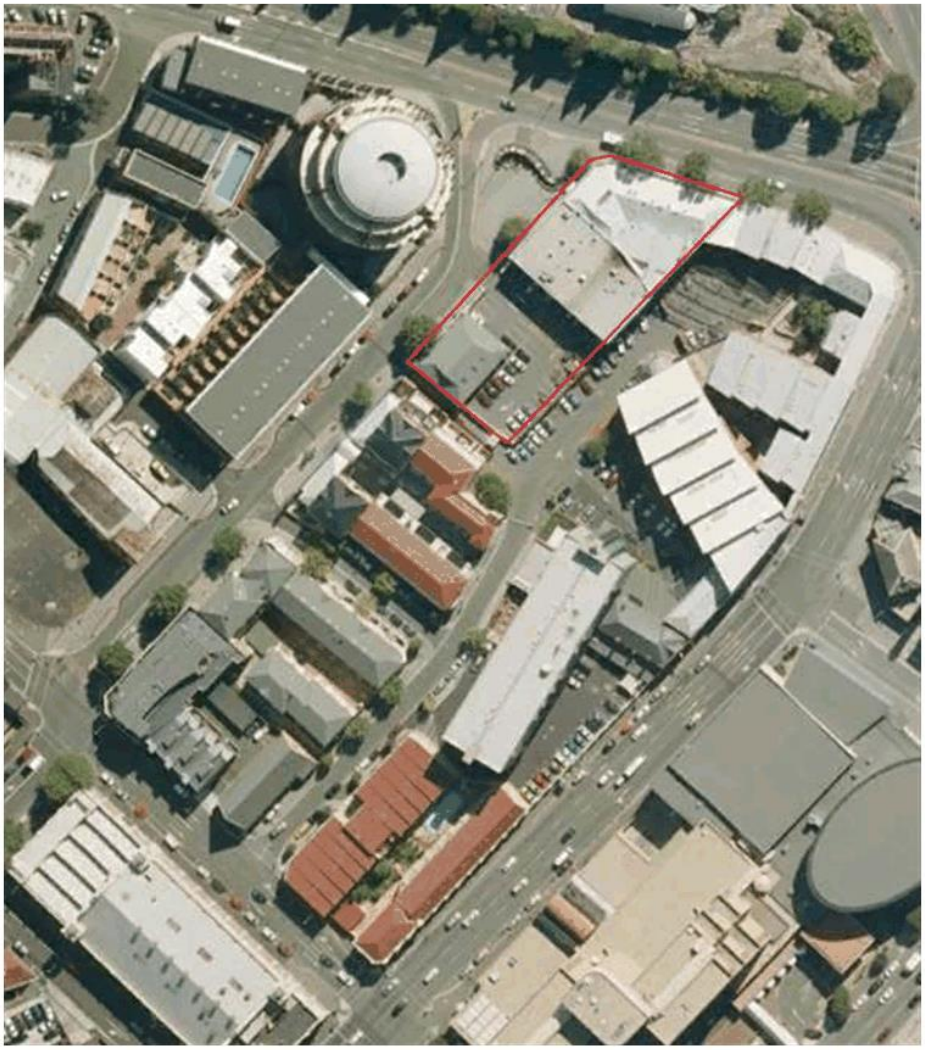


Figure 1.1 - 2008 Aerial image of the area – the subject site depicted in red. GoogleEarth.

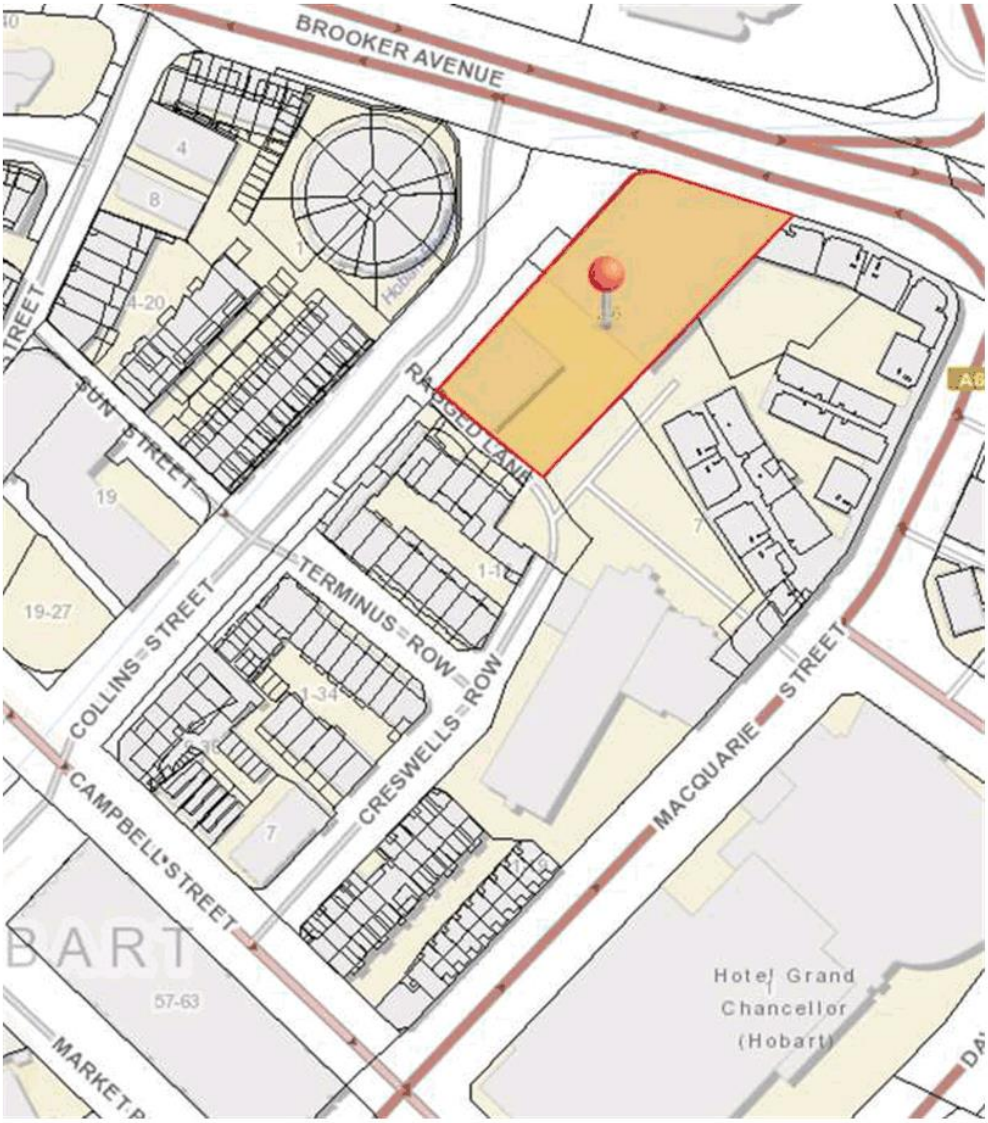


Figure 1.2 – Cadastral parcels comprising the subject site (orange) and surrounds (www.thelist.tas.gov.au).

The assessment of heritage impact been developed with regard to the Articles of the ICOMOS Australia *Burra Charter*[2] (in particular Article 8 – setting) and more specifically industry guideline documents including *Design in Context – Guidelines for Infill Development in the Historic Environment.*[3] Whilst development of the site has been touted, no preliminary design concept was supplied to the author of this document prior to the formulation of this document, therefore the findings of this document were developed without a firm predefined design in-place, therefore adhering to conservation planning best-practice in understanding the significance of the place, and adjacent places, and formulating policy to refine the final design which is to form the development application to Hobart City Council. This is consistent with Burra Charter and conservation planning principles of understanding the significance of a place, developing policy to guide decisions, then formulating responses to such.

[2] www.australia.icomos.org/

[3] Royal Australian Institute of Architects & New South Wales Heritage Office 2005.

2. Statutory heritage requirements

This report has been commissioned to consider the statutory heritage requirements arising from the proposed development. The following requirements are to be met in any development of the subject site:

2.1. Sullivans Cove Planning Scheme 1997

Table 1, Part 22 – Places of Cultural Significance

The subject site is not listed on Table 1 (Places of Cultural Significance) of Part 22 of the Sullivans Cove Planning Scheme 1997, therefore the provisions of Part 22.4 (Conservation of Places of Cultural Significance) do not apply.

By the definition of 'Adjacent' in Part 22.3 of the SCPS97, the subject site is adjacent to 7 Macquarie Street (former Roberts Woolstore – façade facing Macquarie Street and Brooker Avenue only) and 18-26 Collins Street (former HCC/City Motors garage – façade only) which are both listed on Table 1 of Part 22 of the SCPS97.[4] Accordingly, any development of the subject site would be subject to the provisions of Part 22.5 of the scheme (which considers possible impact upon adjacent heritage places).

[4] Note that Figure 5 of the scheme (reproduced in part here as Figure 2.2) indicates a 'Place 20' (being the former Motor Registry building at 1 Collins Street) which has now been demolished – the listing has been removed from Part E, Table 1 but not from the Figure – it is therefore taken that 1 Collins Street is therefore not to be considered as an 'adjacent place' requiring consideration against Part 22.5.

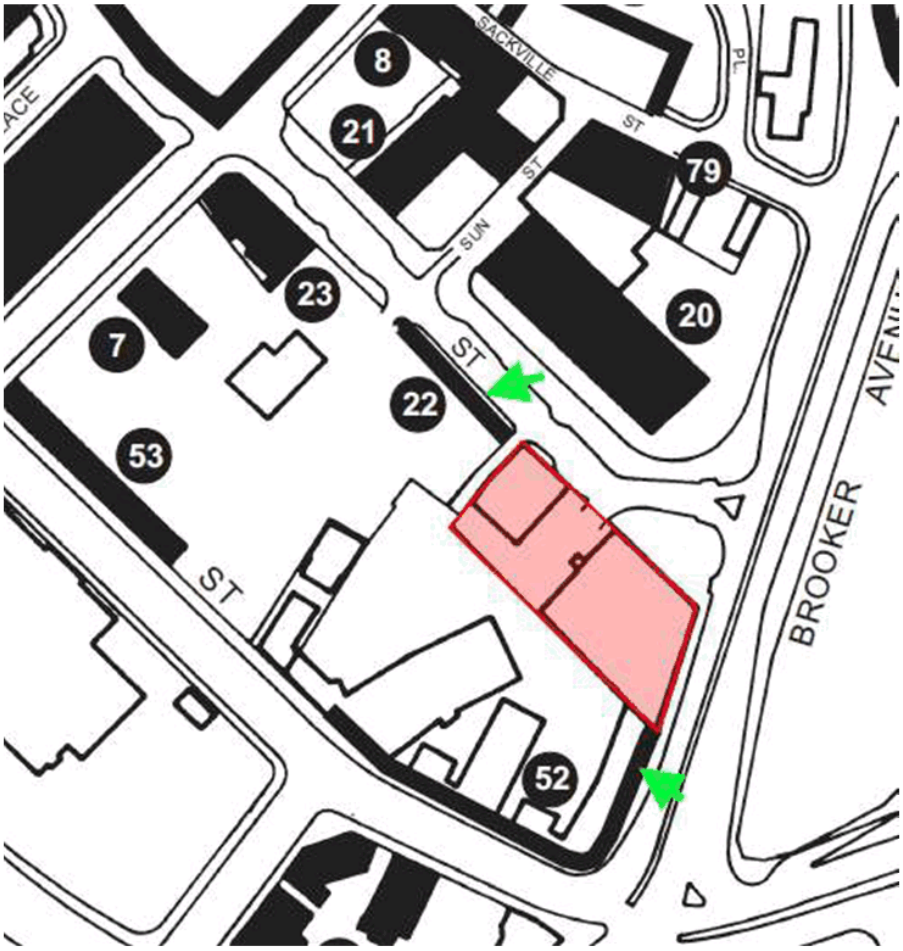


Figure 2.2 – The subject site (outlined in red) in relation to 'adjacent' heritage places as defined by Section 22.3 of the SCPS97 (denoted by green arrows). Adapted from www.thelist.as.gov.au

Accordingly, any proposed development of the subject site must either meet the 'deemed to comply' provisions of Part 22.5.4 the scheme:

> *'Building or works' on other land within the planning area is 'permitted' in respect to this Schedule where it can be demonstrated that the following 'deemed to comply' standards can be met:*
> *For 'building or works' on sites adjacent (as defined in clause 22.3) to a place of cultural significance:*

- *The height of 'building or works' adjacent to places of cultural significance must not exceed that of any building on the place, at a distance of less than 10 (horizontal) metres from the building; and*
- *The area of the facade of any new 'building or works' must not exceed that of the facade of an adjacent place of cultural significance by a factor of 2.*

Otherwise, the planning authority has the discretion to approve building or works which are not deemed to comply, by the provisions of Part 22.5.5 of the scheme:

> *22.5.5 'Discretionary' 'Building or Works' 'Building or works' on land which cannot satisfy the 'deemed to comply' provisions of Clause 22.5.4 may be approved at the discretion of the Planning Authority. The following criteria must be taken into consideration in the assessment of all proposals for 'building or works':*
>
> > *'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public space, or be more prominent in the street than the adjacent place of cultural significance.*
> >
> > *The area of a facade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity.*
> >
> > *'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.*
> >
> > *The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.*
> >
> > *'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.*

Table 2, Part 22 – Places of Archaeological Sensitivity

The subject site is listed as a Place of Archaeological Sensitivity on Table 2 of Part 22 of the SCPS97; however, the archaeological requirements are addressed in a separate document.[5]

In summary, the historic heritage issues around the development of the subject site would be limited to the impacts upon adjacent heritage places, and whether any proposal meets the 'Permitted Building or Works' of Part 22.5.4 of the SCPS97 or whether it would be 'Discretionary Building or Works' under Part 22.5.5.

2.2. Tasmanian Heritage Register

The place is not listed on the Tasmanian Heritage Register, therefore is not subject to the provisions of the *Historic Cultural Heritage Act 1995.*

2.3. Other statutory heritage registers/lists

The place is not listed on any of the following statutory registers:

- The National Heritage List
- The Commonwealth Heritage List
- The World Heritage List

Nor is it included in any buffer zones arising from those lists. Therefore is not subject to the historic heritage provisions of the respective Acts which enable statutory input into development of places on those lists.

[5] *Statement of Historical Archaeological Potential, Archaeological Impact Assessment and Archaeological Method Statement – 2 Collins Street, Hobart, Tasmania* (October 2014, Revised September 2016). Praxis Environment.

3. Background history of the subject site

A detailed background history of the subject site is provided in the following document:

> *Statement of Historical Archaeological Potential, Archaeological Impact Assessment and Archaeological Method Statement – 2 Collins Street, Hobart, Tasmania* (October 2014, Revised September 2016). Praxis Environment. **[hereinafter referred to as the *Praxis Report*].**

The current document should be read in conjunction with that document.

In addition, the following document gives a background to the wider (former) Roberts Limited site, of which the Woolstore building was formerly a part of (part of which is an adjacent place, but not part of the subject site):

> A History of the Roberts Limited Site. Lindy Scripps (unpublished report), 1994.

Further historical information on the wider Wapping area which has provided some context for consideration of wider townscape issues in this document has been gleaned from the following documents:

> *Down Wapping. Hobart's Vanished Wapping and Old Wharf Districts*. Wapping History Group. Blubber Head Press, 1998.
>
> *Wapping, A New Place to Live.* Wapping Implementation Project. Site Histories. Tony Rayner, May 1995
>
> *Archaeological and Heritage Fabric Assessment for Wapping* (Draft). Austral Archaeology, June 1995
>
> *Parcel 4 Wapping. Former Hedberg Garage Building Site. CMP + Development guidelines.* Draft 2. Paul Davies Pty. Ltd., September 2003.
>
> *Archaeological Excavation of Part of Parcel 2, Wapping. Incorporating Excavation Report, List of Appendices and a Guide to the Research Archive.* Austral Archaeology, November 2002.
>
> *Wapping Parcel 4 Archaeological Test Excavation*. Report Prepared for DED and Tourism, Austral Tasmania, May 2009.

4. Adjacent heritage places and historical townscape context

4.1. Townscape evolution of the area

The vicinity of the subject site, including the immediately adjacent sites, is described in the praxis report, with the following figures drawn from that document as a means of providing some background context for the area.

1820s

The area had been developed to some degree by 1820, with early artworks depicting a number of small buildings in the block now bounded by Collins, Macquarie, Campbell Streets and the Hobart Rivulet. The rivulet from an early time, through to the 1910s severed the subject site and provided a very different townscape context to the two adjacent places discussed here – the former Roberts Woolstore is located in former marshland on the northern side of the rivulet, on/near the site of the Government Slaughterhouse which operated from the 1820s-1850s. The former HCC garage was however in more desirable 'high and dry' area to the south of the subject site. From the 1820s to the 1850s, the presence of the government slaughterhouse provided dome disincentive to development near the rivulet, and that development was generally limited to industrial processes – although some capitalising on the proximity to the slaughterhouse, such as tanneries, fellmongers and candle makers. Figure 4.1.1 is an example of that early development and the emerging different townscape contexts on each side of the rivulet:

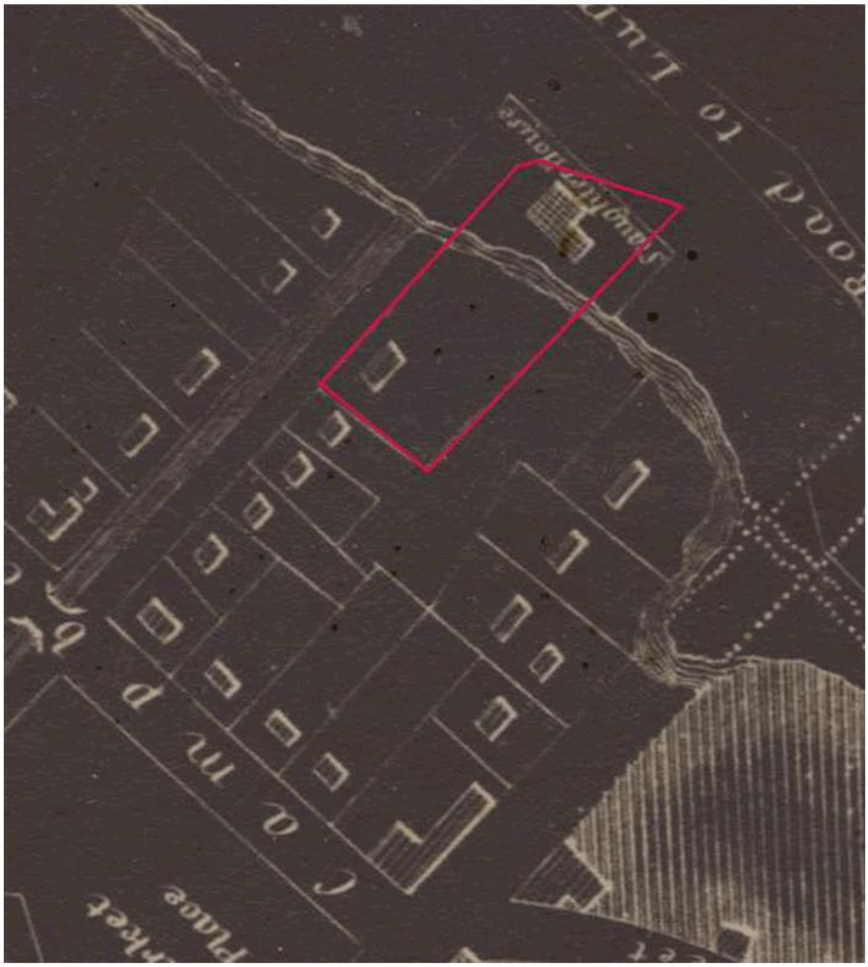


Figure 4.1.1 – Excerpt from an undated (c1820s) survey plan of Hobart (Tasmanian Archive and Heritage Office, PH-30-1-693-1).

1830s

By the 1830s, development had intensified in the area, with more infill to the central portion of the city block, but with an apparent apprehension for development closer to the rivulet – whether this was fear of flooding, or desire for distance to the slaughterhouse – or both. The Woolstore area remained as part of the slaughterhouse and mostly marshland, whilst the HCC Garage site was developed with small scale and ephemeral timber buildings. Figure 4.1.2 depicts the area at that time.

Figure 4.1.2 – Excerpt from a c1830s map of Hobart and surrounds. DPIPWE Map Hobart 5

1840s

A similar pattern of development continued through the 1840s, with further intensification to the south of the subject site. More permanent masonry buildings were replacing the earlier timber buildings, which is the case on the HCC Garage site. The rivulet still provided a great disjunction between the two areas being considered here although a new bridge across the rivulet in the line of Macquarie Street heralded an early step in forming a more cohesive city block in this area. Figure 4.1.3 depicts the area at that time.

Figure 4.1.3 - Excerpt from Sprent's 1841 map of Hobart and surrounds (www.thelist.tas.gov.au).

1850-60s

In the latter part of the 1850s, major change was precipitated by the removal of the government slaughterhouse to Macquarie Point, which offered a redevelopment site on the northern side of the rivulet. Park Street (now Brooker Avenue) was extended to meet Macquarie Street, and the site of the slaughterhouse was subdivided and developed as larger residential dwellings.

Development on the southern side continued, with industry burgeoning and promoting industrial development near the rivulet spreading through to the new section of Macquarie Street and gradually displacing residential development.

1870s-1910

The tables gradually turned from the 1860s onwards, with the new allotments fronting Park Street being sought after, particularly so with the coming of the railway in the 1870s. Older development to the south was interspersed with industrial sites and had become the 'slums' by which Wapping is renowned (and by which it borrowed its name comparatively). The Roberts presence on the site began in 1890 with the purchase of land on the corner of Park and Macquarie Streets and the soonafter construction of the building of which the façade remains. Nonetheless, the Hobart Rivulet still provided a very distinct separation between these two areas and prevented any form of cohesive townscape emerging in the vicinity of the subject site. This is demonstrated by Figures 4.1.4 - 4.1.6:

Figure 4.1.4 – 'Balloons eye view of Hobart' showing the c1820s building frontage (red arrow) and the c1840 conjoined buildings (blue arrow). Australasian Sketcher 10 May 1879.

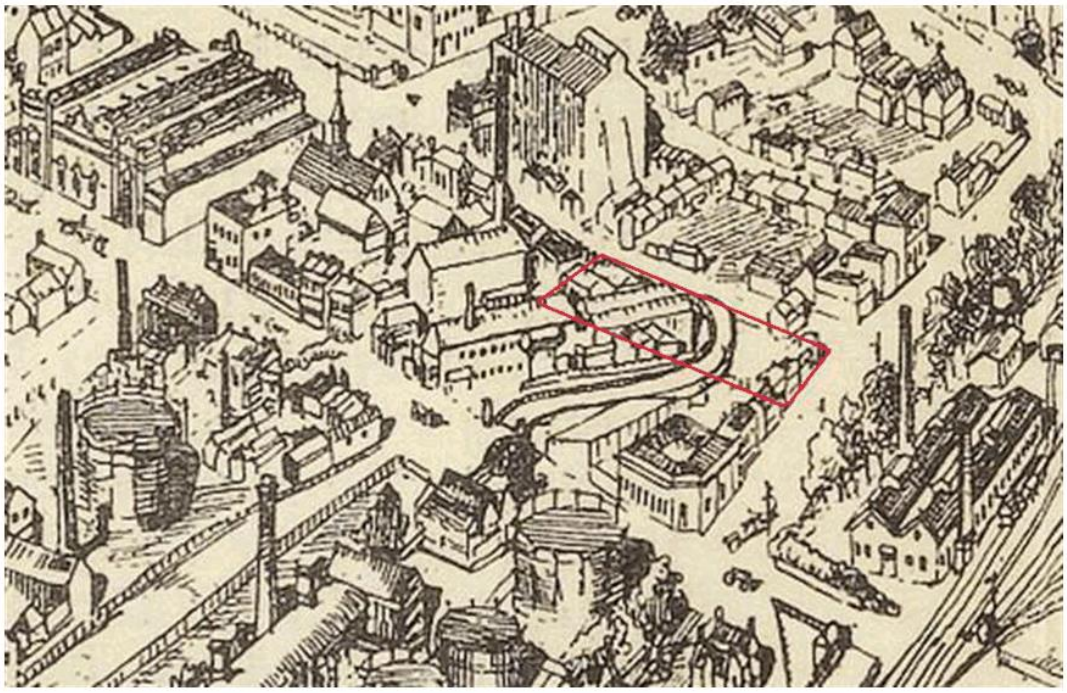


Figure 4.1.5 – Excerpt from a 'Hobart Birds Eye' view, The Town and Country Journal Nov 17 1894 pp26-7.

Figure 4.1.6 – Excerpt from Mault's survey of Hobart 1894, the subject site depicted in red, the location of the HCC garage façade and the (then newly built) Roberts woolstore depicted in Green. Hobart City Council.

1910s

By 1910 it was apparently obvious that the Rivulet was impeding the orderly development of the area and the Hobart Corporation acquired the land required to divert the rivulet around Park Street and fill the rivulet where it ran through the subject site. With that initiative also came the piping of the rivulet under Collins Street. These major capital works commenced in 1916 and were not complete until 1923. Much earlier development was demolished by the Hobart Corporation and the land either then developed by the corporation (e.g. the former HCC garage) or onsold (e.g. the course of the filled rivulet within the subject site was sold to Roberts in 1926). Figure 4.1.7 depicts the immediate environs in1910.

Figure 4.1.7 - Plan showing proposed new channel for the Hobart Rivulet. c. 1910, the subject site outlined in red. Tasmanian Archive and Heritage Office PWD 266/2494/6].

1920-40s

The diversion of the rivulet and the Hobart Corporation involvement in the area stimulated much change during the 1920s, fueled also by expansion of Roberts. The earlier smaller-scale industry had largely been cleared in favour of larger scale Roberts and public corporation facilities (e.g. HCC garage, tramsheds etc) – a trend which continued through the 1930s. Figure 4.1.8 depicts the area c1925 and Figure 4.1.9 is from the 1946 aerial run of Hobart.

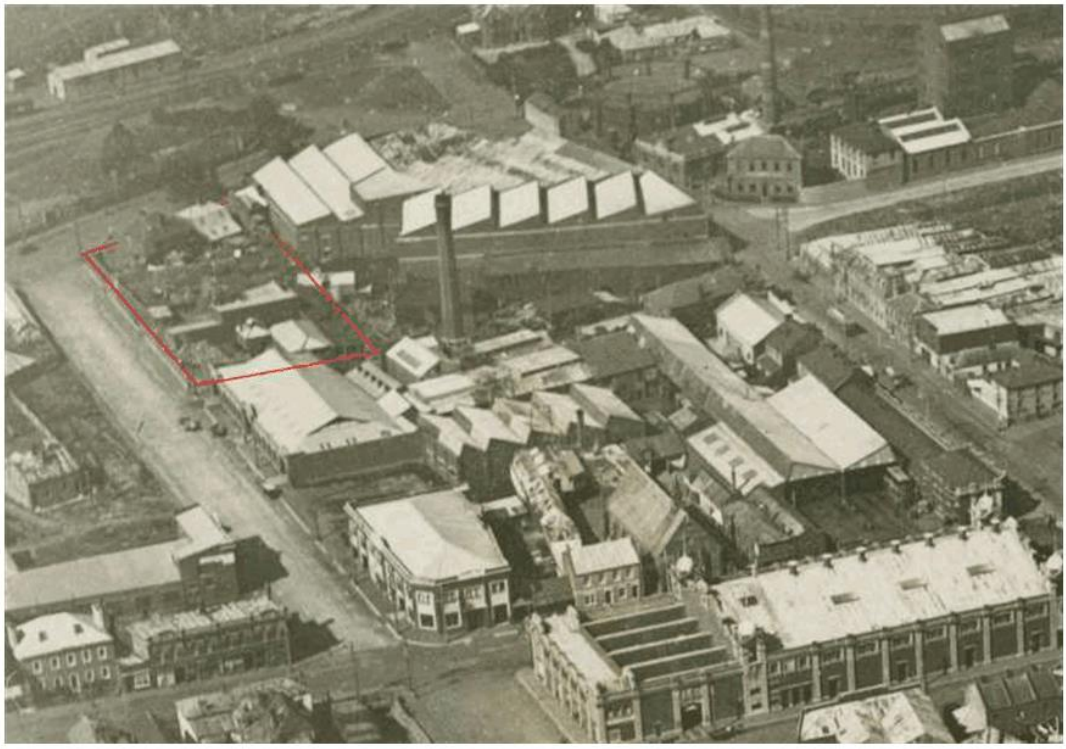


Figure 3.3.23 – Excerpt from an oblique aerial photograph of Hobart, c.mid-1920s. The subject site outlined in red. Tasmanian Archive and Heritage Office NS 892-1-64.

Figure 3.3.25 - The subject site taken from the 1946 aerial run of Hobart (Run 1, 10894).

1950+

During more recent years, the area has undergone a further metamorphis, with residential development rapidly returning to the area with the disbursement of large commercial and semi-industrial uses. Divestment of property by Roberts, starting with the redevelopment of the Old Woolstore Apartment Hotel, removal of the former HCC garage and the tramsheds for the Terminus Row housing development and the early 2000s redevelopment of the former Motor Registry building as One Collins has seen the area become dominated with high-density housing and apartment development.

The above commentary provides a very brief overview of the evolution of the area within which townscape development may be understood. It should be read in conjunction with the sources cited in Section 3. In summary, the subject site and adjacent places has evolved as:

- Two disjointed areas, the slaughterhouse and early residential and industrial development separated by the Hobart Rivulet (c1820-1850).
- A 'flipping' of the above with gentrification of the northern area and a slum-like amalgam of residential and industrial development in the southern area (c1860-1920), still distinctly separated by the rivulet.
- Major environmental changes (diversion of the rivulet) and associated 'cleanup' of the slums heralding new inner-city development areas (1920s-50s).
- Urban regeneration with the divestment of large commercial/industrial holdings and a move to inner city high-density residential uses (1990s+).

This demonstrates the lack of cohesive or planned evolution of the area and how it has changed numerous times in response to changing needs, desires and development pressures as the wider townscape around it also evolves and circumstances change.

4.2. Adjacent places – significance

As detailed in Section 2, although the subject site itself is not listed on Table 1 (Places of Cultural Significance) of Part 22 of the Sullivans Cove Planning Scheme 1997, however by the definition of 'Adjacent' in Part 22.3 of the SCPS97, the subject site is adjacent to 7 Macquarie Street (former Roberts Woolstore – façade facing Macquarie Street and Brooker Avenue only) and 18-26 Collins Street (former HCC/City Motors garage – façade only) which are both listed on Table 1 of Part 22 of the SCPS97. Accordingly, any development of the subject site would be subject to the provisions of Part 22.5 of the scheme (which considers possible impact upon adjacent heritage places).

In order to understand possible impact upon those places, it is necessary to have some understanding of the historic heritage values of those places, particularly within the context of their wider setting, in order to propose policy to guide any further development on the subject site.

Those adjacent heritage places are depicted on Figure 4.1.1 and are namely:

- The former Roberts woolstore Façade fronting Brooker Avenue and Macquarie Street (52)
- The former HCC/City Motors garage façade at 16-26 Collins Street (22)

The following considers the individual significance of each of those places, within their wider townscape context. Note that comprehensive histories of these places is beyond the scope of the current document, however sufficient background (mostly from secondary sources) has been gathered (as per Section 4.1) in order to draw the conclusions within this document consistent with *Burra Charter* process.

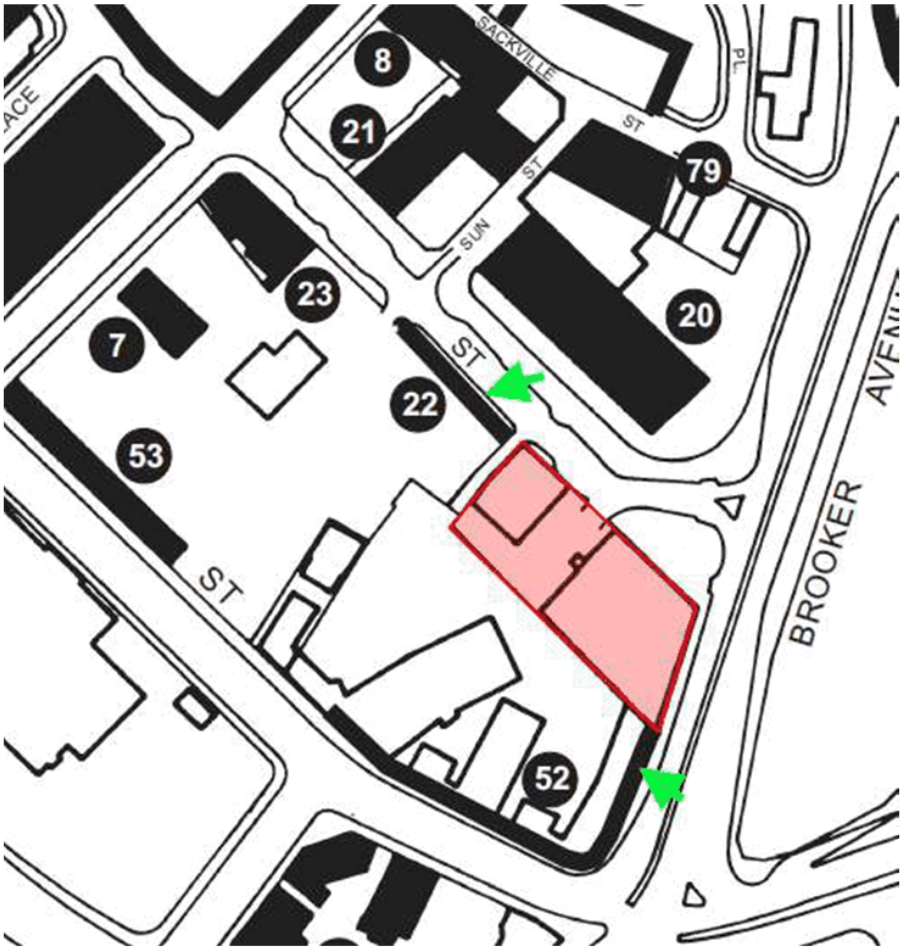


Figure 4.1.1 – 'Adjacent' heritage places as per the Part 22, Table 1 of the SCPS97 *Places of Cultural Significance.*

4.1.1 – The former Roberts Woolstore Façade fronting Brooker Avenue and Macquarie Street

The former Roberts woolstore façade is a single storey brick façade – the Brooker Avenue elevation being blank of apertures however with recessed panels articulation and a concrete rendered pediment/cornice on top of the walls. The first eight bays facing Macquarie Street (from the Brooker Avenue) are of similar wall configuration, however each recess has an arched-top double-hung window. The corner is rounded in three segments with entrance doors. The roof structure facing Brooker Avenue is of a saw-tooth form in brick above the pediment, which has more recently been further accentuated by a heightened roof with the end clad in corrugated galvanised iron.

The roof addressing Macquarie Street is a simpler hipped form, segmented on the corner. Further along Macquarie Street the building retains the same architectural styling, although more highly articulated and ornamented and heightens to two storey, upon which a higher interpretive saw-tooth roof structure has been more recently added.

An analysis of the building beyond the façade is beyond the scope of considerations arising from the inclusion of the façade on Part 22 Table 1 of the scheme.

Figure 4.1.1 – The Macquarie Street/Brooker corner of the former Roberts Woolstore façade. GoogleEarth.

Figure 4.1.2 – The Brooker Avenue facade of the former Roberts Woolstore. GoogleEarth.

Figure 4.1.3 – The Macquarie Street facade of the former Roberts Woolstore. GoogleEarth.

The following statements of significance are based on the national HERCON standard for statements of significance, based on the amount of information currently at-hand. Note that natural history values have not been assessed here, as these are

beyond the scope of this assessment. This statement of significance has been based upon the history of the place as outlined above, however could be further refined with more detailed investigations into the site history.

A. Importance to the course, or pattern of our cultural or natural history.

The former Roberts woolstore façade is of historic heritage significance as it demonstrates the later 19th-century expansion of the Wapping area into new land created by land drainage and rivulet diversion works and the evolution of Macquarie and Park Streets (Brooker Avenue) following the relocation of the earlier government slaughterhouse. The façade is representative of the wider Roberts site which occupied much of the block bounded by Collins, Macquarie, Campbell and Park Streets (Brooker Avenue) and was an important industry representing the statewide rural sector in Tasmania.

B. Possession of uncommon, rare or endangered aspects of our cultural or natural history.

The former Roberts woolstore façade is not considered to exhibit any rare or endangered aspects of our cultural or natural history.

C. Potential to yield information that will contribute to an understanding of our cultural or natural history.

Consideration of research (archaeological) potential is beyond the scope of the current document and as relevant to the subject site is considered elsewhere.

D. Important in demonstrating the principal characteristics of a class of cultural or natural places or environments.

The former Roberts woolstore façade is of some historic heritage significance in its ability to demonstrate the principal characteristics of the façade of a late c19th warehouse. The ability to demonstrate a more holistic warehouse has been limited by demolition of elements rear of the façade.

E. Importance in exhibiting particular aesthetic characteristics

The former Roberts woolstore façade in its own right is of limited aesthetic value as it is not part of any cohesive heritage streetscape nor offers any remarkable aesthetic characteristics.

F. Importance in demonstrating a high degree of creative or technical achievement at a particular period.

The former Roberts woolstore façade is not considered to demonstrate any high degree of creative or technical achievement.

G. Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of their continuing and developing cultural traditions.

No particular community significance is ascribed to the former Roberts woolstore façade.

An assessment of the significance of the place to the Aboriginal community is beyond the scope of this assessment.

H. Special association with the life or works of a person, or group of persons, of importance in our history.

Whilst a detailed analysis of the history of Roberts is beyond the scope of the current assessment, the former Roberts woolstore façade may have some historic heritage significance as an early flagship building associated with a long-run Tasmanian owned company which is still in operation.

4.1.2 – The former HCC Garage/City Motors façade

The former HCC garage façade is a single storey brick façade comprising of a central arched entrance flanked by two additional arched entrances divided by a lower bay to each side, each with four arched windows. The lower portions of the walls are capped with glazed bricks laid on their ends beneath a painted concrete pediment/cornice upon which a brick parapet sits, following the central arch but squarely capping the flanking arches.

An analysis of the building beyond the façade is beyond the scope of considerations arising from the inclusion of the façade on Part 22 Table 1 of the scheme.

Figure 4.1.1 – The Macquarie Street/Brooker corner of the former Roberts Woolstore façade. GoogleEarth.

Figure 4.1.2 – The Brooker Avenue facade of the former Roberts Woolstore. GoogleEarth.

The following statements of significance are based on the national HERCON standard for statements of significance, based on the amount of information currently at-hand. Note that natural history values have not been assessed here, as these are beyond the scope of this assessment. This statement of significance has been based upon the history of the place as outlined above, however could be further refined with more detailed investigations into the site history.

A. Importance to the course, or pattern of our cultural or natural history.

The former HCC garage is of historic heritage significance as it demonstrates a major phase of change in the Wapping area arising from the diversion and undergrounding of the Hobart Rivulet in this area as well as the Hobart Corporation's purchase, clearance and reuse/onselling of the surrounds for post WW1 development, heralding the end of the Wapping slums and the new phase of larger commercial and public-use buildings in the area.

B. Possession of uncommon, rare or endangered aspects of our cultural or natural history.

The former HCC garage façade is not considered to exhibit any rare or endangered aspects of our cultural or natural history.

C. Potential to yield information that will contribute to an understanding of our cultural or natural history.

Consideration of research (archaeological) potential is beyond the scope of the current document and as relevant to the subject site is considered elsewhere.

D. Important in demonstrating the principal characteristics of a class of cultural or natural places or environments.

The former HCC garage façade is of some historic heritage significance in its ability to demonstrate the principal characteristics of the façade of an Inter-War era workshop. The ability to demonstrate a more holistic workshop building has been limited by demolition of elements rear of the façade.

E. Importance in exhibiting particular aesthetic characteristics

The former HCC garage façade in its own right is of limited aesthetic value as it is not part of any cohesive heritage streetscape nor offers any remarkable aesthetic characteristics.

F. Importance in demonstrating a high degree of creative or technical achievement at a particular period.

The former HCC garage façade is not considered to demonstrate any high degree of creative or technical achievement.

G. Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of their continuing and developing cultural traditions.

No particular community significance is ascribed to the former HCC garage

An assessment of the significance of the place to the Aboriginal community is beyond the scope of this assessment.

H. Special association with the life or works of a person, or group of persons, of importance in our history.

Whilst the former HCC garage façade is associated with early c20th Hobart Corporation (i.e. HCC) activities, this is not considered to be sufficient for assignment of associative significance in the absence of strongly meeting other criteria.

4.2 – Development policy for the subject site in relation to adjacent heritage places

Section 4.1 has considered the heritage values of individual buildings adjacent to the subject site – those values which are to be addressed in any development of the subject site, namely:

Both the former Roberts woolstore façade and the former HCC garage façade have some historical significance as they represent distinct and substantial periods of change in the overall evolution of the Wapping area (i.e. Criterion A) and that they represent examples of their respective building types (i.e. a late c19th warehouse and Inter-War workshop) albeit in a very limited capacity owing to only the retention of their façades.

That assessment has concluded that neither of these façades have any significant aesthetic values nor are they part of any cohesive or important heritage streetscape.

It is considered that the key heritage attributes of these façades are that they are representative of important periods of change and development in the Wapping area. The façades themselves are also representing of further change, now being part of new buildings which represent a further phase in the evolution of the Wapping area.

The Wapping area has markedly changed from its first few incarnations as discussed above and development of the subject site offers the opportunity for further such change. As per the comments above, the adjacent heritage places are themselves representative of such change. In the context of the subject site and the potential impact of any development upon adjacent heritage places, **it is not considered necessary to impose any specific heritage policy for the management of impact upon these adjacent places, as to defer to general planning considerations for an acceptable heritage outcome.**

Nonetheless, the following broad comments are made against each of the Performance Criteria under Part 22.5.5 of the scheme in order to address those criteria should any future proposed development not be able to meet the Acceptable Solutions of that Part:

Performance Criteria	Comments
'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public space, or be more prominent in the street than the adjacent place of cultural significance.	Given that the former Roberts woolstore and HCC garage façades are only 1-2 storey high and are merely facades with new and larger scale development behind, it is inevitable that practically any new development on the subject site will be of a larger scale and probably be more prominent than these places of cultural significance in the wider townscape context. This however is not seen as something which is likely to have heritage impact, as the places of cultural significance both derive part of their significance from being representative of the numerous major changes to the pattern of development of the Wapping area and that new development adjacent to these places can be seen as a continuum of that evolution of the area. Over 200 years this area of Wapping has evolved in several distinct stages with larger new forms replacing earlier and smaller scale development in response to the wider evolving townscape – recent developments such as the Old Woolstore apartments, One Collins, Terminus Row and the forthcoming Hedberg Garage development are examples of this new wave and reinvigoration of Wapping which is seen as an acceptable (if not desirable) new phase in the continuum of Wapping's history. To 'under develop' the subject site would perhaps therefore be inconsistent with this precedented tenor of development in the area therefore larger scale development would be consistent with the evolving pattern of development in the area.
The area of a facade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity.	
'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.	As facades, the value of these places is largely limited to their street frontages and contribution to a very limited area of the streetscape and townscape (although noting the visual prominence of the former Roberts woolstore being on the corner of a very busy thoroughfare). Individually they

	have streetscape value however do not greatly contribute to any cohesive streetscape or character area. This area of Wapping is of a very diverse character with more recent and larger development typifying the latest phase of that area.
The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.	This document has assessed the heritage values of those adjacent places of cultural significance and has concluded that their predominant significance derives from their ability to represent buildings indicative of major change phases in the Wapping area (i.e. late c19th larger scale commercialisation and Inter-War wholesale site redevelopment) – i.e. Criterion A. Their architectural values (Criterion D) are considered marginal (given that they are only façades and although the places themselves give provide some streetscape contribution they do not form part of any cohesive or important heritage streetscape. Any new development of the subject site has some potential to backdrop the places of cultural significance – this however is somewhat of a moot point given that these places are façades and that their own development has in effect already set the precedent for larger backdropping development.
'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.	Any development of the subject site should not attempt to emulate any particular historic form. This is particularly important in this location, given the evolving and diverse pattern of use and development of this area it would be undesirable to strongly emulate one particular aspect of that history over others. Nonetheless, subtle visual cues in the design of any new development may be drawn from any of those historic forms as part of an interpretive approach.

5. Proposed development and commentary

A proposal has been formulated by S Group Architecture (Launceston) for a large mixed-use development of the subject site. The proposed project is detailed on drawings *Collins St, A01-09* (22/08/2016) and an Architect's Statement has been provided to accompany those drawings.

Section 4 of the current document has concluded that no specific heritage policy is considered necessary to guide development of the subject site and that the general planning provisions of the scheme are sufficient to guide the development of the site. Nonetheless, it is necessary that response be made to the Performance Criteria of Part 22.5.5 of the scheme (given that the proposal does not meet the Acceptable Solutions of that part) in order for the planning authority to exercise discretion to consider such development which is not deemed to comply.

The following commentary is made with regard to the current proposal:

Performance Criteria	Comments
'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public space, or be more prominent in the street than the adjacent place of cultural significance.	By the nature of the scale of the proposed development, a greater prominence than the places of cultural significance is inevitable – noting also that those places themselves are backdropped in their own right with new buildings of larger scale immediately behind their facades. The proposed development however provides a key 'courtesy' to the smaller scale street frontage of these places. Although a substantially taller development, the

The area of a facade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity. *'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.*	proposal has been formulated in such a way that the street frontages and closely-perceivable form of the building is a four storey podium, upon which the higher component of the development is stepped back from all edges. This is particularly evident in the immediate adjacency to the former Roberts woolstore façade, where the point of contact with that façade is of the lower form to provide a less abrupt and stepped linkage to the taller portion of the proposed building (not largely inconsistent with the abutment of the existing building). Further the proposed façade has been articulated in such a way that the apparent vertical scale is broken by means of a recessed ground floor and articulation of the lower floors through form, cladding, materiality and tone. From all close vantage points where the relationship between the adjacent places and the proposed development are viewable as a streetscape collective, the proposed development will read as a larger building than those adjacent, however in the scheme of the overall size of the building this design response has adequately mitigated the impact of such size in particular to near vantage points where the scale will not appear inconsistent with the tenor of recent development in the area (noting that this large-scale is acceptable, if not desirable, in any case as representing that long-precedented evolution of the Wapping area). The podium will provide the predominant backdrop to the adjacent places and from near vantage. Whilst the tower will be visible as a new element in the wider townscape from more distant vantage points, the perception of the tower will be somewhat disjointed to the near and street

	level relationship of the proposed development and adjacent places.
The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.	As per the statements of significance formulated for the adjacent places in Section 4, their predominant significance derives from their ability to represent buildings indicative of major change phases in the Wapping area (i.e. late c19th larger scale commercialisation and Inter-War wholesale site redevelopment) – i.e. Criterion A. Their architectural values (Criterion D) are considered marginal (given that they are only façades and although the places themselves give provide some streetscape contribution they do not form part of any cohesive or important heritage streetscape. The proposed development offers another phase in the continuum of that evolution of the Wapping area – in fact provides a positive outcome in reinvigorating and activating that area in a manner consistent with the historically precedent rejuvenations of Wapping from which the adjacent places derive much of their significance.
'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.	The building does not mimic any historic form, however offers an evolution of the long-precedented regeneration of the Wapping area.

FRAGRANCE GROUP LIMITED

Fragrance Group Limited
Community Research 2017

October 2017

EMRS
ENTERPRISE MARKETING AND RESEARCH SERVICES

ENTERPRISE MARKETING AND RESEARCH SERVICES

600 Tasmanian adults in the Greater Hobart area were interviewed by telephone between the 6th and the 10th of October 2017.

This report has been prepared by
Enterprise Marketing and Research Services
60 Main Road, Moonah TAS 7009

All enquiries should be addressed to:

Samuel Paske
Chief Operations Director
EMRS
PO Box 402
Moonah TAS 7009

Phone: (03) 6211 1222
Fax: (03) 6211 1219
E-mail: samuel.paske@emrs.com.au

Summary of Key Findings

The Tasmanian research company, EMRS, was assigned to gather independent feedback from local residents in the City of Hobart and surrounding municipalities to assess community opinion regarding proposed new hotel developments in Hobart and the support or opposition to several building height limit options. The research was conducted between the 6th and 10th of October 2017, and 600 adult respondents were interviewed by telephone.

Initial Support for New Hotel Developments in Hobart

- ✓ 68% initial support for new hotel developments in Hobart.

Reasonable Support for Consideration of Increased Building Heights

- ✓ 46% would support buildings in Hobart up to a height of 75 metres;
- ✓ 20% would support buildings in Hobart up to a height of 180 metres; and
- ✓ Importantly, 25% were unable to give a definitive response or did not support any of the 3 heights proposed.

Summary of Key Findings

FRAGRANCE GROUP LIMITED

High Levels of Agreement on Benefits of New hotel Developments

- ✓ 90% agreed that proposed new hotel developments in Hobart would "provide employment and new jobs for Tasmanian's";
- ✓ 87% agreed they would "help meet the need for additional visitor accommodation in Hobart"; while
- ✓ 84% agreed they would "increase economic activity for the State".

Acknowledgement of Negative Aspects

- × Conversely, 76% also agreed the proposed new developments would "create more traffic and congestion in the city";
- × "Lead to too many high-rise developments in the city" (56%); and
- × "Have a negative impact on the visual appeal of Hobart" (55%).

Considered Support for New Hotel Developments Remains Steady

These are very similar to the levels of support recorded initially (68% support, 24% oppose), which indicates that respondents had already made up their minds in regards to new hotel developments and their support was not influenced by consideration of building height limits and statements for and against new hotel developments.

Research Methodology

In order to collect the required information to meet all the research objectives, EMRS used a quantitative survey methodology, namely Computer Assisted Telephone Interviewing (CATI) and the administration of a questionnaire of approximately 5 minutes.

Quotas were put in place for gender and age. To further ensure that the results accurately reflected the demographic profile of the target population with regard to gender and age, weighting was applied where the quotas were not met.

The City of Hobart was the primary target, and as such, 400 surveys were completed within the LGA with the remaining 200 surveys completed in the LGAs of Brighton, Clarence, Glenorchy, Kingborough, and Sorell.

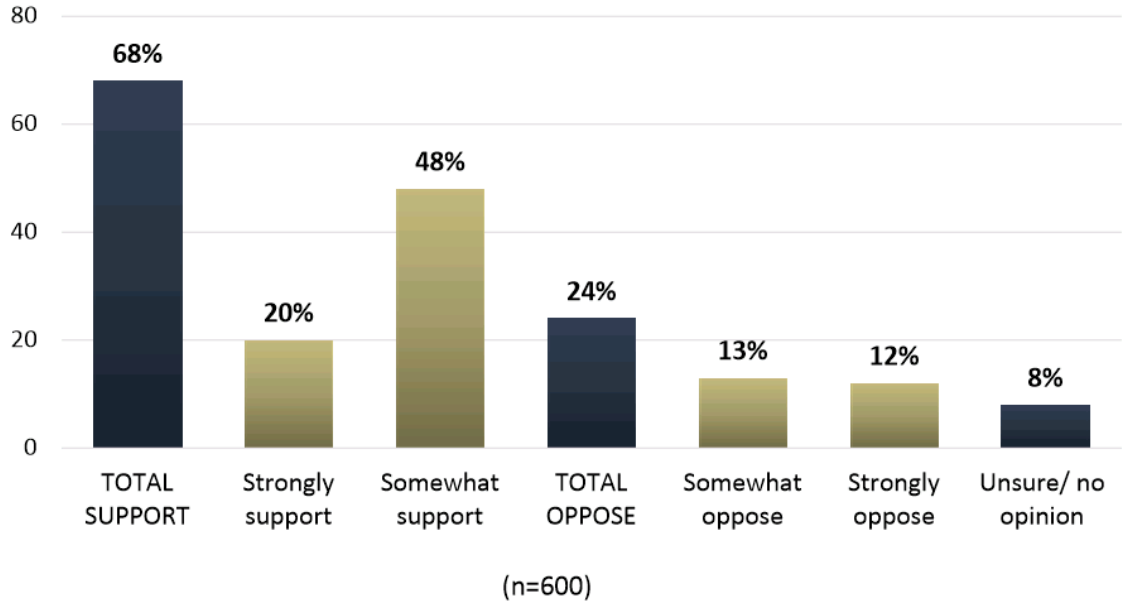
Any statistically significant variations in the results across the population subgroups have been highlighted in the demographic tables, with green denoting a significantly higher percentage and pink a significantly lower one. Significant variations presented in the tables have been remarked upon in the commentary accompanying the charts and tables.

†Percentages in these tables are unweighted.

Initial Support for New Hotel Developments in Hobart

Q. Firstly, even if it is a slight leaning, would you say you strongly support, somewhat support, somewhat oppose or strongly oppose new hotel developments in Hobart?

Chart 1 – Initial Support for New Hotel Developments in Hobart (Percentage of respondents)*



When asked for their initial support of new hotel developments in Hobart generally, close to two-thirds of the total sample were in support, with the larger percentage (48%) of whom stated 'somewhat support'.

Around one quarter of those surveyed (24%) were opposed to new hotel developments in Hobart while the remaining 8% were unable to give a definitive response.

*Percentages do not sum to 100 due to rounding.

Level of Initial Support for New Hotel Developments in Hobart – by Demographic Group

Table 3 – Level of Initial Support for New Hotel Developments in Hobart
(Percentage of respondents by demographic group)*

Demographic Group	TOTAL INITIAL SUPPORT	Strongly support	Somewhat support	TOTAL INITIAL OPPOSE	Somewhat oppose	Strongly oppose	Unsure/ no opinion
Total	68	20	48	24	13	12	8
Gender							
Male	75	25	50	17	9	7	8
Female	61	14	46	32	16	16	8
Age							
18 to 34 years	84	17	67	15	9	6	2
35 to 44 years	66	25	41	25	18	7	9
45 to 54 years	71	25	45	17	11	7	12
55 to 64 years	66	22	44	27	14	12	8
65 years or over	45	14	31	42	16	26	13
Region							
Hobart LGA	66	16	50	26	15	12	8
Surrounding LGAs	72	28	44	20	9	11	8

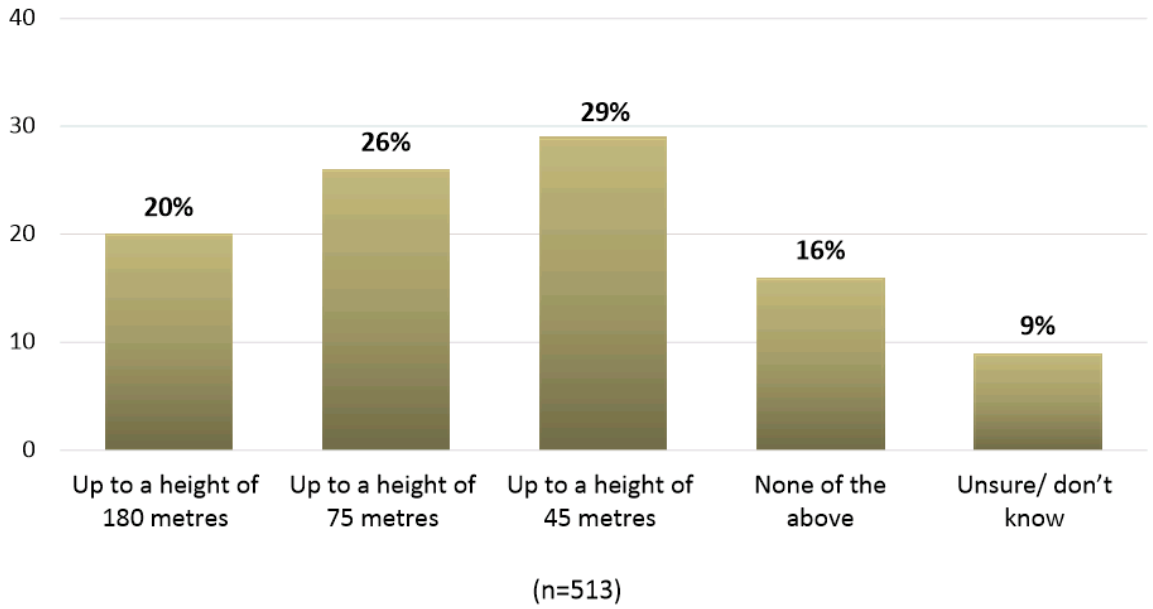
- ✓ Those aged 18 to 44 years were significantly more likely to state that they 'support' new hotel developments in Hobart, when compared to other age groups.
- × Females were significantly more likely to oppose new hotel developments in Hobart (a combined total of 32%, compared to 17% of males).
- × Those aged 65 years and over were significantly less likely to support new hotel developments (a total of 45%) and more likely to oppose them (a total of 42%, with a larger percentage who 'strongly oppose' – 26%).

*Percentages may not sum to 100 due to rounding.

Support for Maximum Height of Hotel Developments Proposed for Hobart CBD

Q. There are currently a number of hotel developments proposed for Hobart. Thinking about the height of proposed hotel developments, would you support or oppose buildings in the Hobart CBD at...

Chart 2 – Support for Maximum Height of Hotel Developments Proposed for Hobart CBD (Percentage of respondents who did not "strongly oppose" new hotel developments in Hobart)*†



(n=513)

*Percentages do not sum to 100 due to rounding.
†The 87 respondents who stated they 'strongly oppose' new hotel developments in Hobart have not been included in this chart.

When asked about maximum heights for proposed hotel developments, more respondents indicated they would support buildings 'up to a height of 45 metres' (29%), followed by 'up to a height of 75 metres' (26%) and 'up to a height of 180 metres' (20%).

25% of those surveyed supported 'none' of the options presented, or were unable to give a definitive response.

Support for Maximum Height of Hotel Developments Proposed for Hobart CBD – by Demographic Group

Table 4 – Support for Maximum Height of Hotel Developments Proposed for Hobart CBD
(Percentage of respondents who did not "strongly oppose" new hotel developments in Hobart by demographic group)*†

Demographic Group	Up to a height of 180 metres	Up to a height of 75 metres	Up to a height of 45 metres	None of the above	Unsure/ don't know
Total	20	26	29	16	9
Gender					
Male	28	24	29	13	5
Female	13	28	28	19	12
Age					
18 to 34 years	35	28	18	9	10
35 to 44 years	16	29	40	9	6
45 to 54 years	21	29	27	14	9
55 to 64 years	13	22	39	19	8
65 years or over	8	22	28	32	10
Local Government Area					
Hobart LGA	17	26	30	17	9
Surrounding LGAs	27	26	25	14	9

× Those aged 65 years and over were significantly less likely to support buildings 'up to a height of 180 metres' (8%) and far more inclined to opt for 'none of the above' (32%).

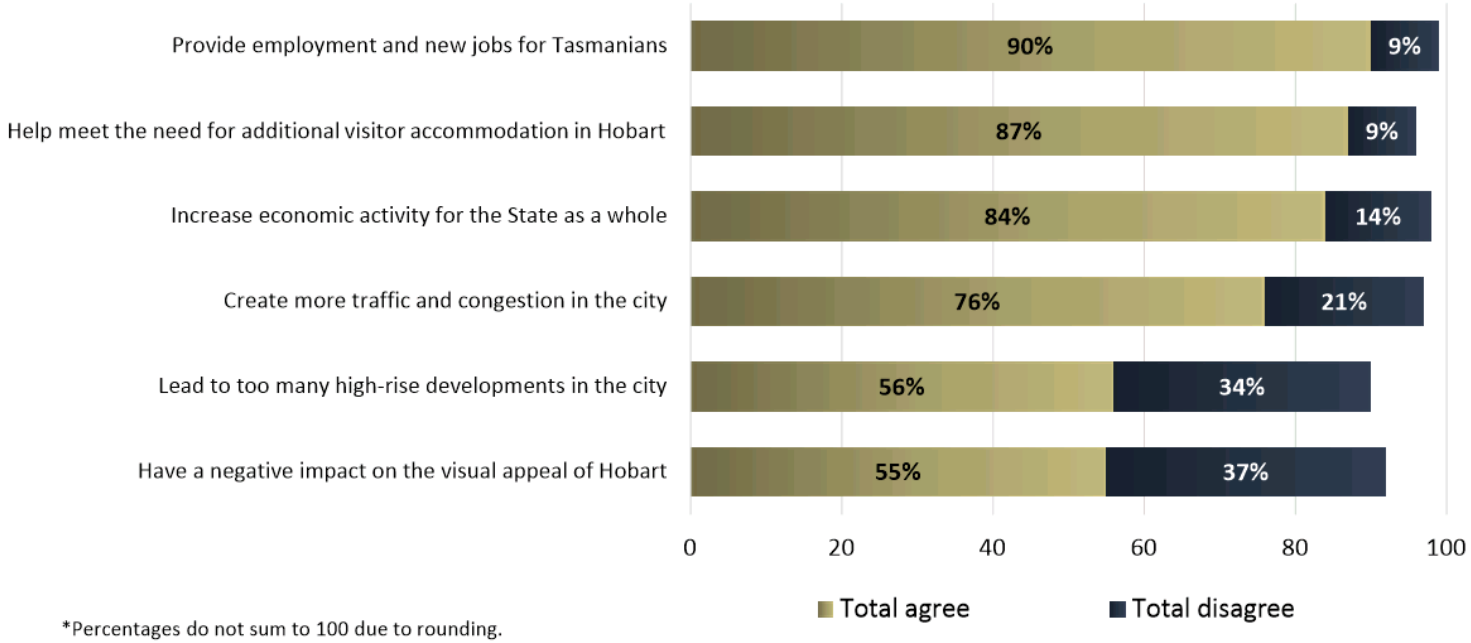
✓ Those aged 18 to 34 years were significantly more likely to state they would support buildings 'up to a height of 180 metres' (35%).

*Percentages do not sum to 100 due to rounding.
†The 87 respondents who stated they 'strongly oppose' new hotel developments in Hobart have not been included in this chart.

Combined Level of Agreement with Statements About New Hotel Developments Proposed in Hobart

Q. I am now going to read out a series of statements that other people have made in support and opposition to proposed new hotel developments in Hobart. For each, could you please tell me whether you agree or disagree with the statement. The hotel developments will...

Chart 3 – Combined Level of Agreement with Statements About New Hotel Developments Proposed in Hobart (Percentage of respondents)



Agreement was high in relation to the 3 positive statements about new hotel developments in Hobart, with the highest level for the statement that they will 'provide employment and new jobs for Tasmanians' (90%).

When it came to the negative statements, those surveyed were most likely to agree that new hotel developments will 'create more traffic and congestion in the city' (76%).

*Percentages do not sum to 100 due to rounding.
†Respondents who were 'unsure' have not been included in this chart.

Level of Agreement with Statements About New Hotel Developments Proposed in Hobart

Table 5 – Level of Agreement with Statements About New Hotel Developments Proposed in Hobart (Percentage of respondents)*

Statements	TOTAL AGREE	Strongly agree	Somewhat agree	TOTAL DISAGREE	Somewhat disagree	Strongly disagree	Unsure/ no opinion
Provide employment and new jobs for Tasmanians	90	52	38	9	6	3	1
Help meet the need for additional visitor accommodation in Hobart	87	45	42	9	5	4	4
Increase economic activity for the State as a whole	84	41	42	14	9	4	3
Create more traffic and congestion in the city	76	39	36	21	14	7	3
Lead to too many high-rise developments in the city	56	31	25	34	22	13	9
Have a negative impact on the visual appeal of Hobart	55	32	22	37	26	11	8

Females were more likely to agree that new hotel developments will:
- 'Lead to too many high-rise developments in the city' (67%, compared to 44% of males)

Those in surrounding LGAs were more likely to agree that new hotel developments will:
- 'Increase economic activity for the State as a whole' (91%, compared to 80% of those in the Hobart LGA)

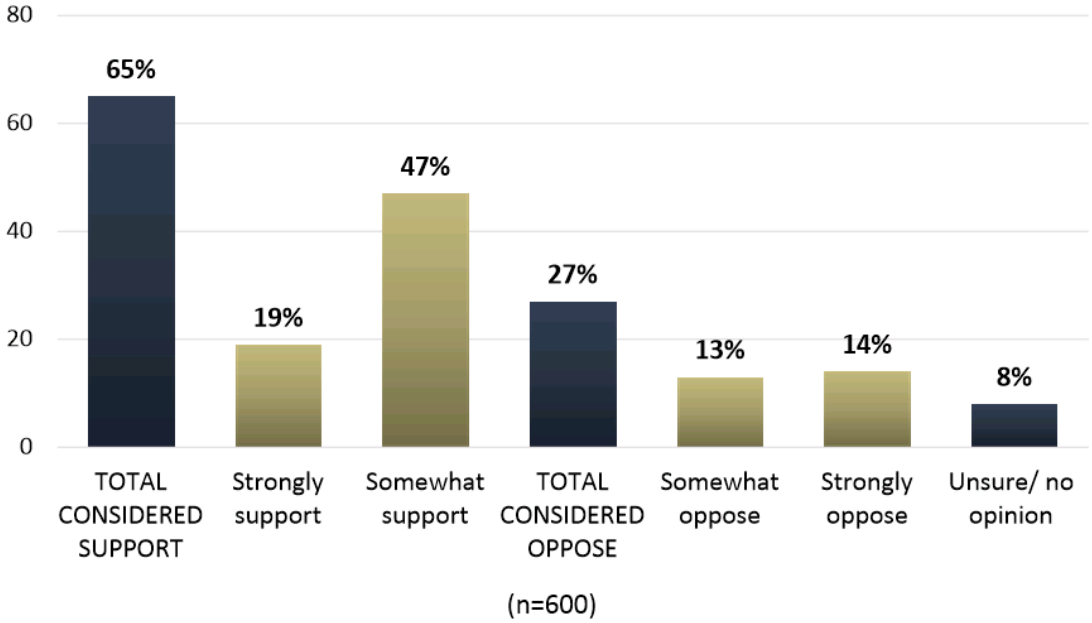
And less likely to agree that new hotel developments will:
- 'Have a negative impact on the visual appeal of Hobart' (49%, compared to 31% of those in the Hobart LGA)

*Percentages may not sum to 100 due to rounding.

Level of Considered Support for New Hotel Developments in Hobart

Q. Sometimes people change their minds on a subject after hearing some arguments for and against it, so would you now say you strongly support, somewhat support, somewhat oppose or strongly oppose new hotel developments in Hobart?

Chart 4 – Level of Considered Support for New Hotel Developments in Hobart (Percentage of respondents)*



*Percentages do not sum to 100 due to rounding.

After hearing arguments for and against the new hotel developments in Hobart, close to two-thirds of respondents in total were still in support (65%), with 27% opposed and the remaining 8% unable to give a definitive response.

These are very similar to the levels of support recorded initially (68% support, 24% oppose), which indicates that respondents had already made up their minds in regards to new hotel developments and their support was not influenced by consideration of building height limits and statements for and against new hotel developments.

Level of Considered Support for New Hotel Developments in Hobart – by Demographic Group

Table 6 – Level of Considered Support for New Hotel Developments in Hobart
(Percentage of respondents by demographic group)*

Demographic Group	TOTAL CONSIDERED SUPPORT	Strongly support	Somewhat support	TOTAL CONSIDERED OPPOSE	Somewhat oppose	Strongly oppose	Unsure/ no opinion
Total	65	19	47	27	13	14	8
Gender							
Male	73	24	50	20	10	10	6
Female	58	14	44	33	15	17	9
Age							
18 to 34 years	83	14	69	12	9	4	5
35 to 44 years	62	18	44	30	18	12	9
45 to 54 years	69	30	39	26	12	14	6
55 to 64 years	59	24	35	30	15	15	10
65 years or over	45	14	31	43	14	29	12
Local Government Area							
Hobart LGA	62	13	49	29	13	16	9
Surrounding LGAs	72	29	43	22	12	10	6

- ✓ Again, those aged 18 to 44 years were significantly more likely to 'support' the new hotel developments (76%).
- × Similarly, those aged 65 years and over were significantly less likely to support new hotel developments (a total of 45%) and more likely to oppose them (43%).
- × Those in the Hobart LGA were now significantly less likely to be in strong support of new hotel developments in Hobart (13%, compared to 29% of those in surrounding LGAs).

*Percentages may not sum to 100 due to rounding.

7.2.2 58 Goulburn Street - Change of Use to Residential (Communal Residence) - PLN-18-565
File Ref: F19/470

Memorandum of the Manager Development Appraisal of 8 January 2019 and attachments.

Delegation: Council

City of HOBART

MEMORANDUM: CITY PLANNING COMMITTEE

58 Goulburn Street - Change of Use to Residential (Communal Residence) - PLN-18-565

Planning application PLN-18-565 proposing a change of use to residential (communal residence) at 58 Goulburn Street, Hobart was considered by the Council at its meeting on 17 December 2018. At that meeting the Council resolved as follows:

> *That the item be deferred to allow time for further clarification as to how the management model of the complex will operate going forward.*

The purpose of this memorandum is to provide further clarification of the complex's proposed management model and to present the planning application for determination.

Discussion

The complex at 58 Barrack Street currently operates under two planning permits (PLN-09-01116 and PLN-12-00021) as a 'welfare institution' (as defined under the *City of Hobart Planning Scheme 1982*). Both permits require, amongst other things, at least one staff member acting in a supervisory capacity to be onsite at all times (ie. 24 hours a day/seven days a week).

The site managers no longer want the operation of the use to be subject to that requirement. They have therefore applied (under planning application PLN-18-565) for a change of use to residential (communal residence), with the management strategy lodged as part of the application not including any requirement for there to be at least one supervisory staff member on the site at all times. Instead, the strategy indicates as follows:

- Anglicare will provide three (3) full-time equivalent (FTE) workers at the complex – one (1) senior and two (2) support workers (8am to 8pm, Monday to Friday);
- Additional funding has been provided for one (1) staff member working six (6) hours on Saturday (4pm to 10pm) and six (6) hours on Sunday (9am to 2pm). This is for a three (3) month period and has been implemented to address concerns raised by tenants. It is not expected to continue.

- Anglicare also have two (2) security patrols on weeknights (around 9pm and 11pm), one (1) on Saturday (around midnight) and two (2) on Sunday (6 pm and 10pm);
- There is also the option available to tenants to call security should the need arise outside of the patrol hours. To date, the only calls to security have been when tenants have locked their keys in their units;
- The regular security patrols are expected to wind down, with the option that tenants will still be able to call security as needed (i.e. on-call). As with the other facilities Anglicare manages across the state, if there are concerns at any given times, Anglicare will arrange ad-hoc patrols. Security services will retain the ability of phoning Anglicare's on-call Area Managers if the need arises.

As noted in the planning application's officer report previously considered by the City Planning Committee and the Council (attached below), independent legal advice regarding the classification of the use of the property was sought prior to assessing the planning application. That advice reads:

> *"The Council's planning officer has assessed the DA and has formed the view that:*
>
> *(a) the use which is proposed should be classified as "residential";*
>
> *(b) the proposal should be treated as "permitted", so that the Council is required to grant a permit; and*
>
> *(c) there is nothing in the planning scheme which supports the imposition of a condition requiring a staff member to be on-site at all times, and there is no basis to refuse the DA on the basis that this is not proposed.*
>
> *You have asked for advice on whether or not the planning officer's assessment is correct.*
>
> *In our view:*
>
> *(a) the planning officer has properly characterised the use as falling within the "residential" use class;*
>
> *(b) based on our understanding that the DA complies with all applicable standards (such as parking), a permit must be granted by the Council; and*
>
> *(c) the proposal for a staff-member to be on call may be imposed as a condition, and there is no ability for the Council to impose a more onerous management strategy."*

A second legal opinion resulting from an earlier deferral of the application by the City Planning Committee at its meeting of 10 December 2018 was also considered in the closed session of the City Planning Committee of 17 December 2018.

As indicated in the officer report assessing the planning application (Attachment A to this memorandum), the proposal complies with all acceptable solutions for all applicable standards within the *Hobart Interim Planning Scheme 2015.* The application is therefore permitted and does not require public advertising in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*. That section of the Act also requires that Council must approve the application.

An extension of time has been granted by the applicant until 22 January 2019 to allow consideration by the Council at the meeting scheduled for 21 January 2019.

RECOMMENDATION

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for change of use to residential (communal residence) at 58 Goulburn Street, Hobart for the reasons outlined in the officer report of 5 December 2018 (Attachment A to this memorandum) and a permit containing the following conditions be issued:

GEN

The use and/or development must be substantially in accordance with the documents and drawings that comprise PLN-18-565 - 58 GOULBURN STREET HOBART TAS 7000 except where modified below.

Reason for condition

To clarify the scope of the permit.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit the Council's website for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

BUILDING PERMIT

You may need building approval in accordance with the *Building Act 2016.* Click here for more information.

This is a Permitted Planning Permit issued in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*.

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Rohan Probert
MANAGER DEVELOPMENT APPRAISAL

Date: 8 January 2019
File Reference: F19/470

Attachment A: PLN-18-565 - 58 GOULBURN STREET HOBART TAS 7000 - Planning Committee or Delegated Report ⇩

Attachment B: PLN-18-565 - 58 GOULBURN STREET HOBART TAS 7000 - CPC Agenda Documents ⇩

City of HOBART

APPLICATION UNDER HOBART INTERIM PLANNING SCHEME 2015

Type of Report:	Committee
Committee:	17 December 2018
Expiry Date:	17 December 2018
Application No:	PLN-18-565
Address:	58 GOULBURN STREET , HOBART
Applicant:	(Neil Shephard and Associates obo Communities Tasmania) PO Box 273
Proposal:	Change of Use to Residential (Communal Residence)
Representations:	N/A
Performance criteria:	N/A

1. Executive Summary

1.1 Planning approval is sought for Change of Use to Residential (Communal Residence) at 58 Goulburn Street, Hobart.

1.2 More specifically the proposal includes:

- Changing the use of the property from 'welfare institution' (the use group approved under the *City of Hobart Planning Scheme 1982*) to 'residential (communal residence)' (the use category that the use falls into under the *Hobart Interim Planning Scheme 2015*).
- Changes to the management model of the site whereby there will no longer be a staff member on site at all times. Instead, at certain times when there is not a staff member on site, there will be someone on call who will attend the property if any issues arise.
- The new management model for the site will include the following:
  - Anglicare will provide three (3) full-time equivalent (FTE) workers at Goulburn Street – one (1) senior and two (2) support workers (8am to 8pm Monday to Friday).
  - Additional funding has been provided to provide one (1) staff member working six (6) hours Saturday (4pm to 10pm) and six (6) hours Sunday (9am to 2pm). This is for a three (3) month period and has been implemented to address concerns raised by tenants. It is not expected to continue.
  - Anglicare also have two (2) security patrols on weeknights (around 9pm and 11pm), one (1) on Saturday (around midnight) and two (2) on Sunday (6 pm and 10pm).
  - There is also the option available to tenants to call security should the need arise outside of the patrol hours. To date, the only calls to security have been when tenants have locked their keys in their units.
  - The regular security patrols are expected to wind down, with the option that tenants will still be able to call security as needed (i.e. on-call). As with the other facilities Anglicare manage across the state, if there are concerns at any given times, Anglicare will arrange ad-hoc patrols. Security services will retain the ability of phoning Anglicare on-call Area Managers if the need arises.

1.3 The proposal complies with all acceptable solutions for all applicable standards.

1.4 The application is therefore permitted and was not publicly advertised in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*.

1.5 The proposal must be approved in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*.

1.6 The final decision is delegated to the Council due to the application being called in by an Alderman/Councillor.

2. Site Detail

2.1 The property has frontages to three streets: Goulburn, Liverpool and Barrack. The property is rated as 58 Goulburn Street. 275 Liverpool Street is the Council owned car park (subdivided from the rest of the site and on a separate title) and so has not been included in the address of the development.

Fig. 1. Subject property.

Fig. 2. Subject property (Goulburn Street frontage). Source: GoogleMaps.

Fig. 3. Subject property (corner Barrack and Liverpool Streets). The ground floor car park is 275 Liverpool Street and owned by the Hobart City Council. The first and second levels are part of 58 Goulburn Street and form part of the subject site. Source: GoogleMaps.

3. Proposal

3.1 Planning approval is sought for Change of Use to Residential (Communal Residence) at 58 Goulburn Street, Hobart.

3.2 More specifically the proposal includes:

- Changing the use of the property from 'welfare institution' (the use group approved under the *City of Hobart Planning Scheme 1982*) to 'residential (communal residence)' (the use category that the use falls into under the *Hobart Interim Planning Scheme 2015*).
- Changes to the management model of the site whereby there will no longer be a staff member on site at all times. Instead, at certain times when there is not a staff member on site, there will be someone on call who will attend the property if any issues arise.
- The new management model for the site will include the following:
  - Anglicare will provide three (3) full-time equivalent (FTE) workers at Goulburn Street – one (1) senior and two (2) support workers (8am to 8pm Monday to Friday).
  - Additional funding has been provided to provide one (1) staff member working six (6) hours Saturday (4pm to 10pm) and six (6) hours Sunday (9am to 2pm). This is for a three (3) month period and has been implemented to address concerns raised by tenants. It is not expected to continue.
  - Anglicare also have two (2) security patrols on weeknights (around 9pm and 11pm), one (1) on Saturday (around midnight) and two (2) on Sunday (6 pm and 10pm).
  - There is also the option available to tenants to call security should the need arise outside of the patrol hours. To date, the only calls to security have been when tenants have locked their keys in their units.
  - The regular security patrols are expected to wind down, with the option that tenants will still be able to call security as needed (i.e. on-call). As with the other facilities Anglicare manage across the state, if there are concerns at any given times, Anglicare will arrange ad-hoc patrols. Security services will retain the ability of phoning Anglicare on-call Area Managers if the need arises.

4. Background

4.1 The welfare institution use at the site was approved under two planning permits: PLN-09-01116 in 2009 and PLN-12-00021 in 2012. Both permits were granted under the *City of Hobart Planning Scheme 1982*.

4.2 The site was divided into two zones under the *City of Hobart Planning Scheme 1982*. The Goulburn Street end of the site was zoned Residential 1 and the Liverpool Street end was zoned Central Service.

The 2009 permit approved the 'welfare institution' use on the Goulburn Street portion of the site and flats on the Liverpool Street portion of the site (this is because 'welfare institution' was, under the *City of Hobart Planning Scheme 1982,* a prohibited use in the Central Service Zone, and so this use could not be approved on the Liverpool Street end of the site).

In 2012, a section 43A amendment was issued, which made 'welfare institution' a discretionary use on the Liverpool Street portion of the site, and so the flats which were approved in 2009 were able to be approved as 'welfare institution' under PLN-12-00021.

4.3 The 2009 permit includes condition 35 as follows:

The operator of the welfare institution component of the development must maintain and implement a management strategy generally in accordance with the Goulburn Street Property & Tenancy Overview dated April 2010 (attachment B). The management strategy must include provision for at least one (1) staff member to be on-site at all times and be acting in a supervisory capacity. A current copy of the management strategy is to be provided to the Hobart City Council at the time of the first occupation of the welfare institution component of the development and at any time after that event upon the request of the Hobart City Council.

Reason for condition: To ensure the safe and effective management of the Welfare Institution

4.4 This is very similar to condition 8 on the 2012 permit, which reads:

The operator of the welfare institution must maintain and implement a management strategy. The management strategy must include provision for at least one (1) staff member to be on-site at all times and be acting in a supervisory capacity. A current copy of the management strategy is to be provided to the Hobart City Council at the time of the first occupation of the welfare institution and at any time after that event, upon the request of the Hobart City Council.

Reason for condition: To ensure the safe and effective management of the welfare institution.

4.5 The site managers no longer want the operation of the use across the entirety of the site to be subject to a requirement for a staff member to be onsite 24 hours a day. The operators have therefore applied (under the current planning application) for a change of use to residential (communal residence). The Anglicare Management Strategy update which was lodged with the current application does not propose that at least one supervisory staff member will be on the site at all times. Instead, the strategy states that there will be staff members on the site 8am to 8pm Monday to Friday, one staff member on site for part of the day on Saturday and Sunday (this is a three month interim measure and is not expected to continue) and security patrols at specified times during the evening and night, seven days a week.

4.6 The application is considered to be for a change of use rather than a partial change of use because the ground floor of the Liverpool Street end of the site (275 Liverpool Street) is not part of the site. This property has been subdivided vertically from the rest of the site. It is owned by the Hobart City Council, is rated as 275 Liverpool Street, and is used as an 'unlisted use (car park)' which was approved under PLN-09-01112.

4.7 Prior to assessing the planning application (PLN-18-565), Council sought independent legal advice in relation to the classification of the use of the property. This preliminary advice reads:

"The Council's planning officer has assessed the DA and has formed the view that:

(a) the use which is proposed should be classified as "residential";

(b) the proposal should be treated as "permitted", so that the Council is required to grant a permit; and

(c) there is nothing in the planning scheme which supports the imposition of a condition requiring a staff member to be on-site at all times, and there is no basis to refuse the DA on the basis that this is not proposed.

You have asked for advice on whether or not the planning officer's assessment is correct.

In our view:

(a) the planning officer has properly characterised the use as falling within the "residential" use class;

(b) based on our understanding that the DA complies with all applicable standards (such as parking), a permit must be granted by the Council; and

(c) the proposal for a staff-member to be on call may be imposed as a condition, and there is no ability for the Council to impose a more onerous management strategy."

5. Concerns raised by representors

5.1 As the proposal complies with all acceptable solutions for all applicable standards, the application is deemed to be 'permitted', and must be approved without public advertising in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*.

6. Assessment

6.1 The *Hobart Interim Planning Scheme 2015* is a performance based planning

scheme. To meet an applicable standard, a proposal must demonstrate compliance with either an acceptable solution or a performance criterion. Where a proposal complies with a standard by relying on one or more performance criteria, the Council may approve or refuse the proposal on that basis. The ability to approve or refuse the proposal relates only to the performance criteria relied on.

6.2 The site is located within the Inner Residential Zone and the Central Business Zone of the *Hobart Interim Planning Scheme 2015*.

6.3 The existing use is 'welfare institution' which was approved under the provisions of the *City of Hobart Planning Scheme 1982* under application numbers PLN-09-01116 and PLN-12-00021.

6.4 The use class 'welfare institution' does not exist under the current planning scheme (the *Hobart Interim Planning Scheme 2015*). This planning scheme has the use class 'residential' which includes all residential types, irrespective of whether they are supported or managed accommodation or not. The 'residential' use class is defined as:

Use of land for self contained or shared living accommodation. Examples include an ancillary dwelling, boarding house, communal residence, hostel, residential aged care home, residential college, respite centre, retirement village and single or multiple dwellings.

6.5 There are no use standards for any of the uses within the 'residential' use class. Simply put, the scheme does not recognise any difference between people living in owner-occupied dwellings, rented dwellings or supported accommodation, and subsequently does not require that some dwelling types are treated or assessed differently to others. As a result, there is no discretion under the *Hobart Interim Planning Scheme 2015* to require that some of the uses within this category (e.g. supported accommodation) have management strategies.

6.6 The units do not have laundries and so are not considered to be 'dwellings'. They therefore have not been classified as 'multiple dwellings' (which is more than one dwelling on a lot). The occupiers of the units have their own private space (bathroom, bedroom, lounge and kitchenette), and parts of the facility are also shared amongst all residents (e.g. recreation rooms and laundry). The development is therefore considered to be a 'communal residence' which is one of the sub-groups in the 'residential' use category.

A communal residence is defined as:

Means use of land for a building to accommodated persons who are unrelated to

one another and who share some parts of the building. Examples include a boarding house, residential college and residential care home.

6.7 'Residential' (including a 'communal residence') is a permitted use in the Inner Residential Zone and permitted use above ground floor level in the Central Business Zone. The ground floor of the site within the Central Business Zone is a Council owned car park, and the residential use is on the first and second floor levels.

The change of use is therefore permitted within both zones and must be approved by Council.

6.8 There is no discretion in relation to the provision of on-site parking spaces. The site has 12 spaces, which is the required number under clause E.6.6.1 A1 of the Parking and Access Code.

6.9 The proposal has been assessed against:

6.4.1 Part D - 11.0 Inner Residential Zone Standards

6.4.2 Part D - 22.0 Central Business Zone Standards

6.4.3 Part E - 6.0 Parking and Access Code

6.9 The proposal complies with all acceptable solutions for all applicable standards.

7. Discussion

7.1 Planning approval is sought for Change of Use to Residential (Communal Residence).

7.2 The application was not advertised, in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*.

7.3 The proposal has been assessed against the provisions of the *Hobart Interim Planning Scheme 2015* and does not rely on any performance criteria to satisfy the scheme's relevant standards and codes. As such, the proposal must be approved by Council in accordance with the provisions of section 58 of the *Land Use Planning and Approvals Act 1993*.

7.4 The proposal has not been assessed by other Council officers.

7.5 The proposal must be approved.

8. Conclusion

8.1 The proposed Change of Use to Residential (Communal Residence) at 58 Goulburn Street satisfies the relevant provisions of the *Hobart Interim Planning Scheme 2015*, and as such is recommended for approval.

9. Recommendations

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for Change of Use to Residential (Communal Residence) at 58 Goulburn Street HOBART for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GEN

The use and/or development must be substantially in accordance with the documents and drawings that comprise PLN-18-565 - 58 GOULBURN STREET HOBART TAS 7000 except where modified below.

Reason for condition

To clarify the scope of the permit.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit the Council's website for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

BUILDING PERMIT

You may need building approval in accordance with the *Building Act 2016.* Click here for more information.

This is a Permitted Planning Permit issued in accordance with section 58 of the *Land Use Planning and Approvals Act 1993*.

(Liz Wilson)
Development Appraisal Planner

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Rohan Probert)
Manager Development Appraisal

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 5 December 2018

Attachment(s):

Attachment B - CPC Agenda Documents

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
163538	1
EDITION	DATE OF ISSUE
2	23-Apr-2012

SEARCH DATE : 09-Aug-2018
SEARCH TIME : 09.21 AM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Strata Plan 163538 and a general unit entitlement operating for all purposes of the Strata Scheme being a 115 undivided 1/230 interest
Derived from Strata Plan 163538
Derivation : Part of 0A-1R-14P Gtd. to W Harris, Part of 0A-OR-33P Gtd. to D Dunkley and Part of Location to Moody

SCHEDULE 1

D27249 TRANSFER to DIRECTOR OF HOUSING Registered 23-Apr-2012 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
The registered proprietor holds the lot and unit entitlement subject to any interest noted on common property Folio of the Register volume 163538 folio 0
SP163005 EASEMENTS in Schedule of Easements
SP160824 & SP163005 FENCING PROVISION in Schedule of Easements

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
163538	2
EDITION	DATE OF ISSUE
2	23-Apr-2012

SEARCH DATE : 05-Dec-2018
SEARCH TIME : 09.04 AM

DESCRIPTION OF LAND

City of HOBART
Lot 2 on Strata Plan 163538 and a general unit entitlement operating for all purposes of the Strata Scheme being a 115 undivided 1/230 interest
Derived from Strata Plan 163538
Derivation : Part of 0A-1R-14P Gtd. to W Harris, Part of 0A-OR-33P Gtd. to D Dunkley and Part of Location to Moody

SCHEDULE 1

D27249 TRANSFER to DIRECTOR OF HOUSING Registered 23-Apr-2012 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
The registered proprietor holds the lot and unit entitlement subject to any interest noted on common property Folio of the Register volume 163538 folio 0
SP163005 EASEMENTS in Schedule of Easements
SP160824 & SP163005 FENCING PROVISION in Schedule of Easements

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
163538	0
EDITION	DATE OF ISSUE
2	27-May-2014

SEARCH DATE : 09-Aug-2018
SEARCH TIME : 09.21 AM

DESCRIPTION OF LAND

City of HOBART
The Common Property for Strata Scheme 163538
Derivation : Part of 0A-1R-14P Gtd. to W Harris, Part of 0A-OR-33P Gtd. to D Dunkley and Part of Location to Moody
Prior CT 163005/2

SCHEDULE 1

STRATA CORPORATION NUMBER 163538, 54 BARRACK STREET, HOBART

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP163005 EASEMENTS in Schedule of Easements
D121797 BURDENING ELECTRICITY INFRASTRUCTURE EASEMENT with the benefit of a restriction as to user of land in favour of Aurora Energy Pty Ltd over the land marked Electricity Infrastructure Easement 4.53 wide shown on Sealed Plan 163005 (Subject to Provisions) Registered 27-May-2014 at noon
SP160824 & SP163005 FENCING PROVISION in Schedule of Easements

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FOLIO PLAN

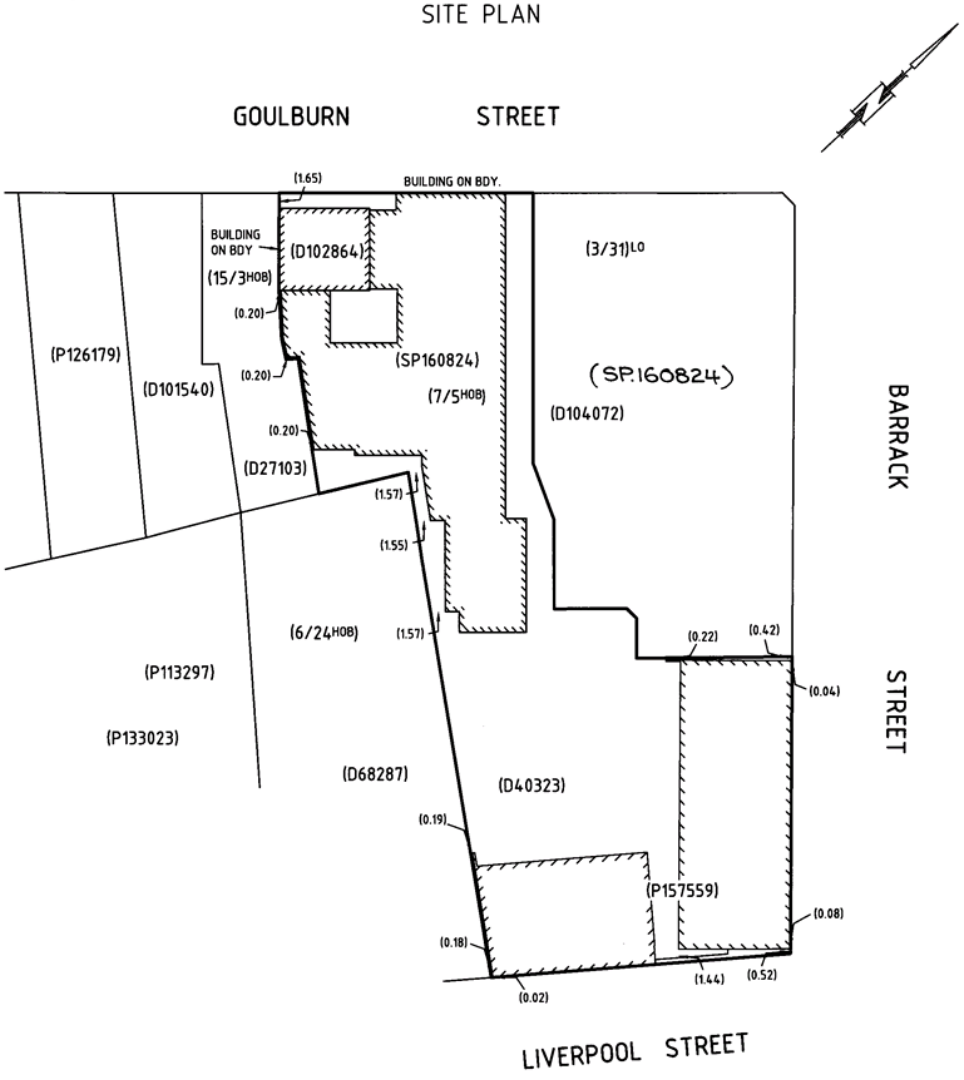
RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

CITY OF HOBART SUBURB/LOCALITY FOLIO REFERENCE C. T. 163005-2 SITE COMPRISES THE WHOLE OF LOT 2 ON SEALED PLAN No. 163005	**SITE PLAN** SHEET 1 OF 6 SHEETS	Registered Number **163538**
	NAME OF STRATA SCHEME 54 BARRACK STREET, HOBART	STRATA TITLES ACT 1998 REGISTERED 22 FEB 2012 Alice Kawa Recorder of Titles
MAPSHEET MUNICIPAL CODE No.(5225-52)114 LAST UPI No. HRT13	SCALE 1: 400 LENGTHS IN METRES	

SITE PLAN



NOTES: (i) ALL BUILDINGS ON THE SITE TO BE SHOWN ON SHEET 1. (ii) BUILDING TO SITE BOUNDARY OFFSETS OF LESS THAT 2.00 METRES TO BE SHOWN ON SHEET 1.	Council Delegate 15-2-2012 Date	Registered Land Surveyor 16-1-2012 Date N841M-3B Ref. No.
STAGED/COMMUNITY DEVELOPMENT. SCHEME No. (IF APPLICABLE)	LODGED BY PEACOCK DARCEY & ANDERSON PTY LTD.	

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

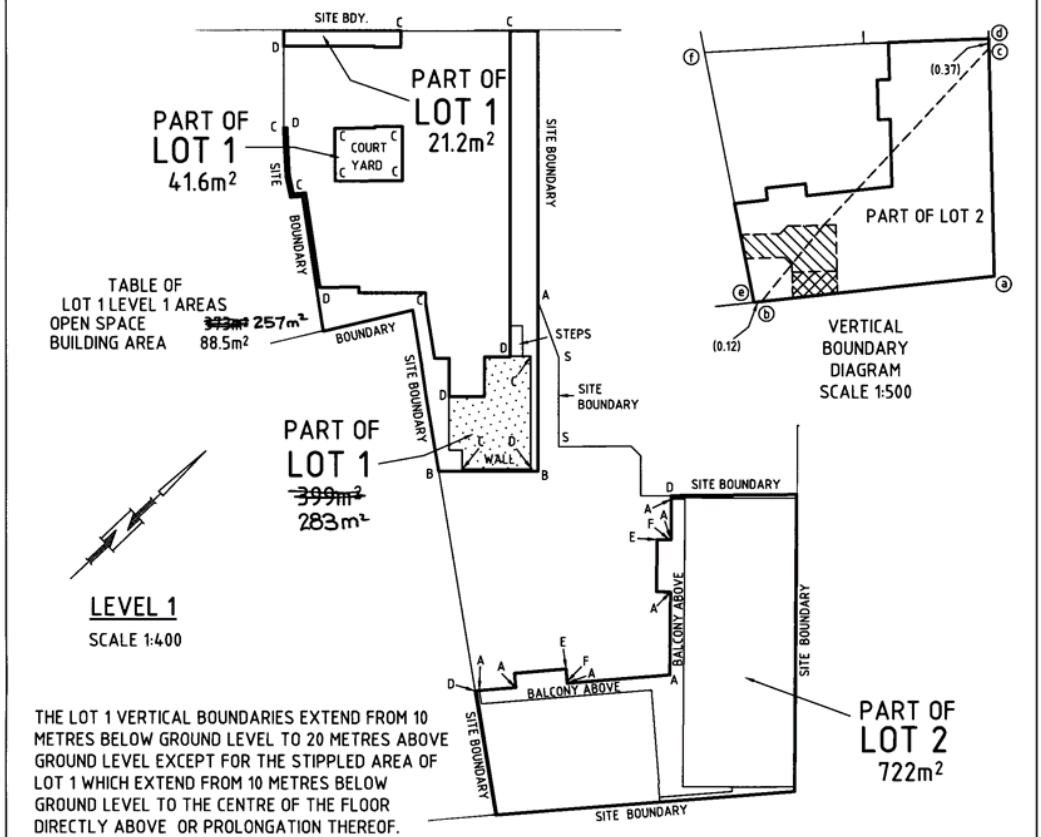
STRATA PLAN

SHEET 2 OF 6 SHEETS

STRATA TITLES ACT 1998

Council Delegate 15-2-2012 Date

Registered Number 163538



THE LOT 1 VERTICAL BOUNDARIES EXTEND FROM 10 METRES BELOW GROUND LEVEL TO 20 METRES ABOVE GROUND LEVEL EXCEPT FOR THE STIPPLED AREA OF LOT 1 WHICH EXTEND FROM 10 METRES BELOW GROUND LEVEL TO THE CENTRE OF THE FLOOR DIRECTLY ABOVE OR PROLONGATION THEREOF.

THE HORIZONTAL LOT BOUNDARIES (SHOWN BY HEAVY UNBROKEN LINES) AND THE STIPPLED AREA ARE DEFINED BY:

- SITE BOUNDARY
- OPEN BOUNDARY 'AB' PARALLEL AND OFFSET 2.25 METRES TO SITE BOUNDARY LABELLED 'SS'
- OPEN BOUNDARY 'BB' PARALLEL AND OFFSET 0.10 METRES TO FACE OF WALL LABELLED 'WALL'
- COURTYARD FACE OF WALL ON LEVEL 3 LABELLED 'CC
- OUTSIDE FACE OF WALL ON LEVEL 3 LABELLED 'CD'
- CENTRE OF WALL LABELLED 'DD'
- EDGE OF BALCONY ON LEVEL 2 LABELLED 'AA' & EXTENSION THEREOF LABELLED 'AD'
- EDGE OF STAIRS LABELLED 'AE', 'EF' & EXTENSION THEREOF LABELLED 'AF'

THE LOWER LOT 2 VERTICAL BOUNDARY IS DEFINED BY:

- 'abc' (EXCLUDING THE HATCHED & CROSS HATCHED PORTIONS) WHICH IS A SLOPING PLANE DEFINED BY A HEIGHT OF 24.78 AHD83 AT POINT ⓐ AND A HEIGHT OF 25.50 ALONG THE LINE 'bc'
- 'befdc' (EXCLUDING THE HATCHED PORTION) WHICH IS A SLOPING PLANE DEFINED BY A HEIGHT OF 25.60 AHD83 AT POINT ⓕ AND A HEIGHT OF 25.50 AHD83 ALONG THE LINE 'bc'
- THE HATCHED AREA WHICH IS 25.80 AHD83
- THE CROSS HATCHED AREA WHICH IS 25.60 AHD83

(SEE SURVEY NOTES WITH SP163005 FOR HATCHED AND CROSS HATCHED AREA HORIZONTAL FIXATION)

THE UPPER LOT 2 VERTICAL BOUNDARY EXTENDS TO THE CENTRELINE OF THE FLOOR ABOVE OR PROLONGATION THEREOF.

AREAS ARE APPROXIMATE ONLY.

Registered Land Surveyor 16-1-2012 Date N841M-3B Surveyors ref.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

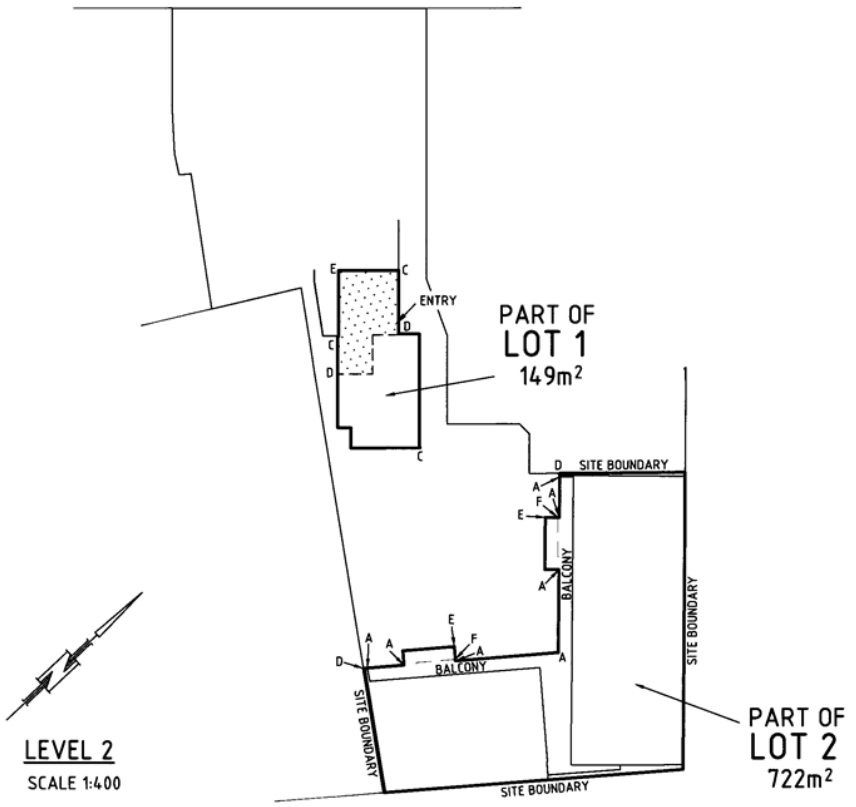
STRATA PLAN

SHEET 3 OF 6 SHEETS

STRATA TITLES ACT 1998

Council Delegate 15-2-2012 Date

Registered Number 163538



LEVEL 2

SCALE 1:400

THE HORIZONTAL LOT BOUNDARIES ARE SHOWN BY HEAVY UNBROKEN LINES AND DEFINED BY:

- SITE BOUNDARY
- EDGE OF BALCONY LABELLED 'AA' & EXTENSION THEREOF LABELLED 'AD'
- OUTSIDE FACE OF WALL ON LEVEL 3 LABELLED 'CD'
- EDGE OF STAIRS ON LEVEL 1 LABELLED 'AE', 'EF' & EXTENSION THEREOF LABELLED 'AF'
- CENTRE OF WALL LABELLED 'CE'

THE HORIZONTAL BOUNDARY OF THE STIPPLED AREA IS ALSO DEFINED BY:

- CENTRE OF WALL ON LEVEL 1 LABELLED 'DD'

THE LOT 1 VERTICAL BOUNDARIES EXTEND FROM THE CENTRE OF THE FLOOR DIRECTLY BELOW OR PROLONGATION THEREOF TO THE CENTRE OF THE FLOOR DIRECTLY ABOVE OR PROLONGATION THEREOF EXCEPT FOR THE STIPPLED PORTION WHICH EXTENDS FROM 10 METRES BELOW GROUND LEVEL TO THE CENTRE OF THE FLOOR DIRECTLY ABOVE OR PROLONGATION THEREOF.

THE LOT 2 VERTICAL BOUNDARIES EXTEND FROM THE CENTRE OF THE FLOOR DIRECTLY BELOW OR PROLONGATION THEREOF TO A HEIGHT OF 20 METRES ABOVE THE LOWER LOT 2 VERTICAL BOUNDARY DEFINED ON SHEET 2.

AREAS ARE APPROXIMATE ONLY.

Registered Land Surveyor 16-1-2012 Date N841M-3B Surveyors ref.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

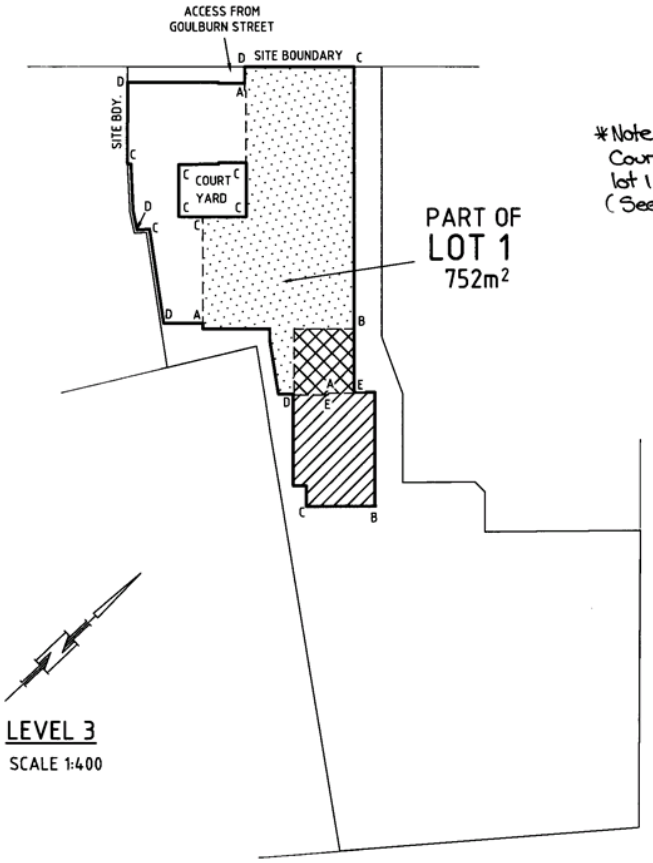
STRATA PLAN

SHEET 4 OF 6 SHEETS

STRATA TITLES ACT 1998

Council Delegate 15-2-2012 Date

Registered Number 163538



THE HORIZONTAL LOT BOUNDARIES ARE SHOWN BY HEAVY UNBROKEN LINES AND DEFINED BY:

- SITE BOUNDARY
- OUTSIDE FACE OF WALLS LABELLED 'CD', 'AD', 'BC' & 'BE'
- COURTYARD FACE OF WALL LABELLED 'CC'

THE HORIZONTAL BOUNDARIES OF THE STIPPLED & CROSS HATCHED AREAS ARE ALSO DEFINED BY:

- CENTRE OF WALL ON LEVEL 1 LABELLED 'AE'
- CENTRE OF WALL ON LEVEL 2 LABELLED 'BD'
- OUTSIDE FACE OF WALL ON LEVEL 4 LABELLED 'AC' & 'DE'

THE LOWER VERTICAL LOT BOUNDARY EXTENDS TO 10 METRES BELOW GROUND LEVEL FOR THE UNFILLED & STIPPLED AREAS AND TO THE CENTRE OF THE FLOOR DIRECTLY BELOW OR PROLONGATION THEREOF FOR THE HATCHED & CROSS HATCHED AREAS.

THE UPPER VERTICAL LOT BOUNDARY EXTENDS TO 20 METRES ABOVE GROUND LEVEL FOR THE UNFILLED & HATCHED AREAS AND TO THE CENTRE OF THE FLOOR DIRECTLY ABOVE OR PROLONGATION THEREOF FOR THE STIPPLED & CROSS HATCHED AREAS.

AREAS ARE APPROXIMATE ONLY.

Registered Land Surveyor 16-1-2012 Date N841M-3B Surveyors ref.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

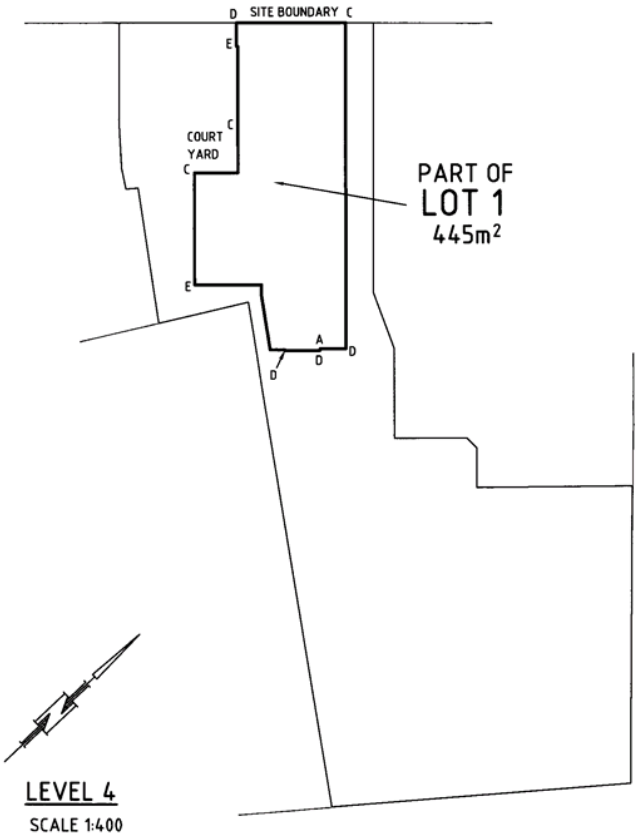
STRATA PLAN

SHEET 5 OF 6 SHEETS

STRATA TITLES ACT 1998

Council Delegate 15-2-2012 Date

Registered Number 163538



LEVEL 4

SCALE 1:400

THE HORIZONTAL LOT BOUNDARIES ARE SHOWN BY HEAVY UNBROKEN LINES AND DEFINED BY:

- SITE BOUNDARY
- OUTSIDE FACE OF WALLS LABELLED 'DD' & 'CE'
- COURTYARD FACE OF WALL ON LEVEL 3 LABELLED 'CC'
- OUTSIDE FACE OF WALLS ON LEVEL 3 LABELLED 'CD' & 'DE'
- CENTRE OF WALL ON LEVEL 1 LABELLED 'AD'

THE VERTICAL LOT BOUNDARIES EXTEND FROM THE CENTRE OF THE FLOOR DIRECTLY BELOW OR PROLONGATION THEREOF TO A HEIGHT OF 20 METRES ABOVE GROUND LEVEL.

AREAS ARE APPROXIMATE ONLY.

Registered Land Surveyor 16-1-2012 Date N841M-3B Surveyors ref.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

STRATA PLAN

SHEET 6 OF 6 SHEETS

STRATA TITLES ACT 1998

Registered Number: 163538

NAME OF BODY CORPORATE: STRATA CORPORATION No. 163538 — 54 BARRACK STREET, HOBART

ADDRESS FOR THE SERVICE OF NOTICES: HOUSING INNOVATIONS UNIT, GPO BOX 125, HOBART 7001.

SURVEYORS CERTIFICATE

I Simon Roberts of Hobart

a surveyor registered under the Surveyors Act 2002 certify that the building or buildings erected on the site and drawn on sheet 1 of this plan are within the site boundaries of the folio stated on sheet 1 and any encroachment beyond those boundaries is properly authorised according to law.

Registered Land Surveyor | 16-1-2012 Date | N841M-3B Ref No

COUNCIL CERTIFICATE

I certify that the HOBART CITY Council has:

(a) approved the lots shown in this plan and

(b) issued this certificate of approval in accordance with section 31 of the Strata Titles Act 1998

Council Delegate | 15-2-2012 Date | 5655460 Ref No

GENERAL UNIT ENTITLEMENTS

LOT	UNIT ENTITLEMENT
1	115
2	115
TOTAL	230

NEIL SHEPHARD & ASSOCIATES

Planning and Development Consultants

General Manager
Hobart City Council
16 Elizabeth Street
HOBART TAS 7000

5 December 2018

Dear Sir,

RE: PLN-18-565 - 58 GOULBURN STREET AND 275 LIVERPOOL STREET – SUPPORTED RESIDENTIAL FACILITY – CHANGE OF USE TO RESIDENTIAL

I refer to your letter of 13 September 2018 requesting further information.

Accordingly, I seek to revise the application to being one for 'change of use to residential'.

BACKGROUND

In 2009 the Resource Management and Planning Appeal Tribunal approved a 'welfare' institution' use on the Goulburn Street portion of the site, and 'flats' on the Liverpool Street portion (Permit PLN-09-01116-01), under the *City of Hobart Planning Scheme 1982*.

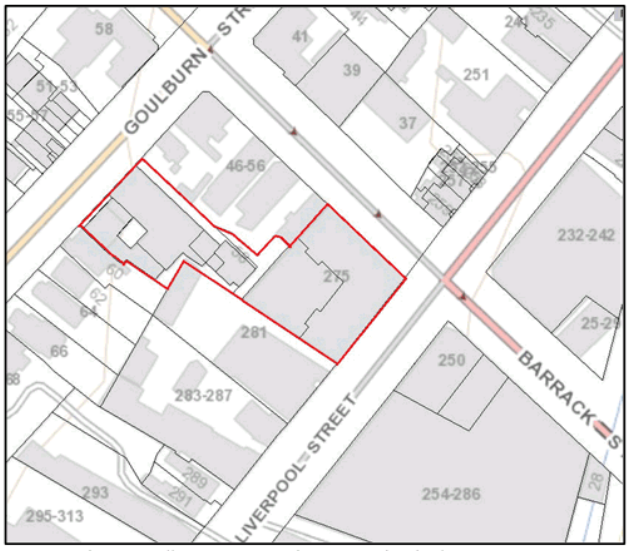


***Figure 1**: location (base source: TheLIST 06/08/18)*

The Tribunal imposed the following condition 35 on the permit:

> *The operator of the welfare institution component of the development must maintain and implement a management strategy generally in accordance with the Goulburn Street Property & Tenancy Overview dated April 2010 (attachment B). The management strategy must include provision for at least one (1) staff member to be on-site at all times and be acting in a supervisory capacity. A current copy of the management strategy is to be provided to the Hobart City Council at the time of the first occupation of the welfare institution component of the development and at any time after that event upon the request of the Hobart City Council.*
>
> ***Reason for condition***
>
> ***To ensure the safe and effective management of the Welfare Institution***

In 2012 the Tasmanian Planning Commission approved an amendment to the *City of Hobart Planning Scheme 1982* making 'welfare institution' a discretionary use on the Liverpool Street portion of the site, allowing the existing flats to be approved as 'welfare institution'.

The subsequent permit (PLN-12-00021-01) included the following condition 8:

> *The operator of the welfare institution must maintain and implement a management strategy. The management strategy must include provision for at least one (1) staff member to be on-site at all times and be acting in a supervisory capacity. A current copy of the management strategy is to be provided to the Hobart City Council at the time of the first occupation of the welfare institution and at any time after that event, upon the request of the Hobart City Council.*
>
> ***Reason for condition***
>
> ***To ensure the safe and effective management of the welfare institution.***

PROPOSAL

Changes to the management model mean that 24-hour on-site management will no longer be provided. Instead there will be someone on call who will attend the property if any issues arise.

Council has advised that the proposal cannot be assessed as an 'alteration to existing use' as the originally approved use (Welfare Institution) no longer exists under the current planning scheme (see below). Accordingly, it is necessary to apply for a new permit for a change of use.

STATUTORY PLANNING CONSIDERATIONS

Use

The relevant planning scheme is now the *Hobart Interim Planning Scheme 2015* ('the interim planning scheme').

'Welfare institution' is no longer a separate use class under the interim planning scheme, but rather is classified as 'residential'.

'Residential', is a permitted use in the Inner Residential zoned portion of the site, and permitted if above ground floor level in the Central Business zoned portion of the site.

The required change of use to residential is therefore permitted in both zones.

Development

No development is proposed.

Car parking

Twelve (12) parking spaces are currently provided on-site (including 1 disability space).

Pursuant to clause E6.6.5, parking is not required within the Central Business Zone.

The 25 residential units within the Inner Residential Zone do not have their own private laundry facilities, and so pursuant to clause 4.1.3 are not considered to be separate dwellings under the planning scheme. The closest 'match' for such use under Table E.6.1 in the Parking and Access Code is 'boarding house or hostel or residential college' which has a parking requirement of one (1) space for each staff member and one (1) for every three (3) licensed residents.

Three (3) FTE and one (1) PTE staff members operate on site requiring a total of four (4) car spaces, whilst the residential requirement in the Inner Residential Zone would be 25 units divided by 3 = 8.3 spaces (8). The 12 spaces provided are therefore sufficient to comply with the relevant Acceptable Solution.

On-site management
A revised management plan reflecting the new operational changes is attached.

If you require any further information or clarification, please do not hesitate to contact me in the first instance.

Yours faithfully,

NEIL SHEPHARD BA, MTCP(Syd), FPIA, CPP

Obo. Communities Tasmania

Attachment:

- Management Strategy Update 8 August 2018
- Floor plans with car parking

58 GOULBURN STREET AND 275 LIVERPOOL STREET – SUPPORTED RESIDENTIAL FACILITY

Anglicare Management Strategy updates

8 August 2018

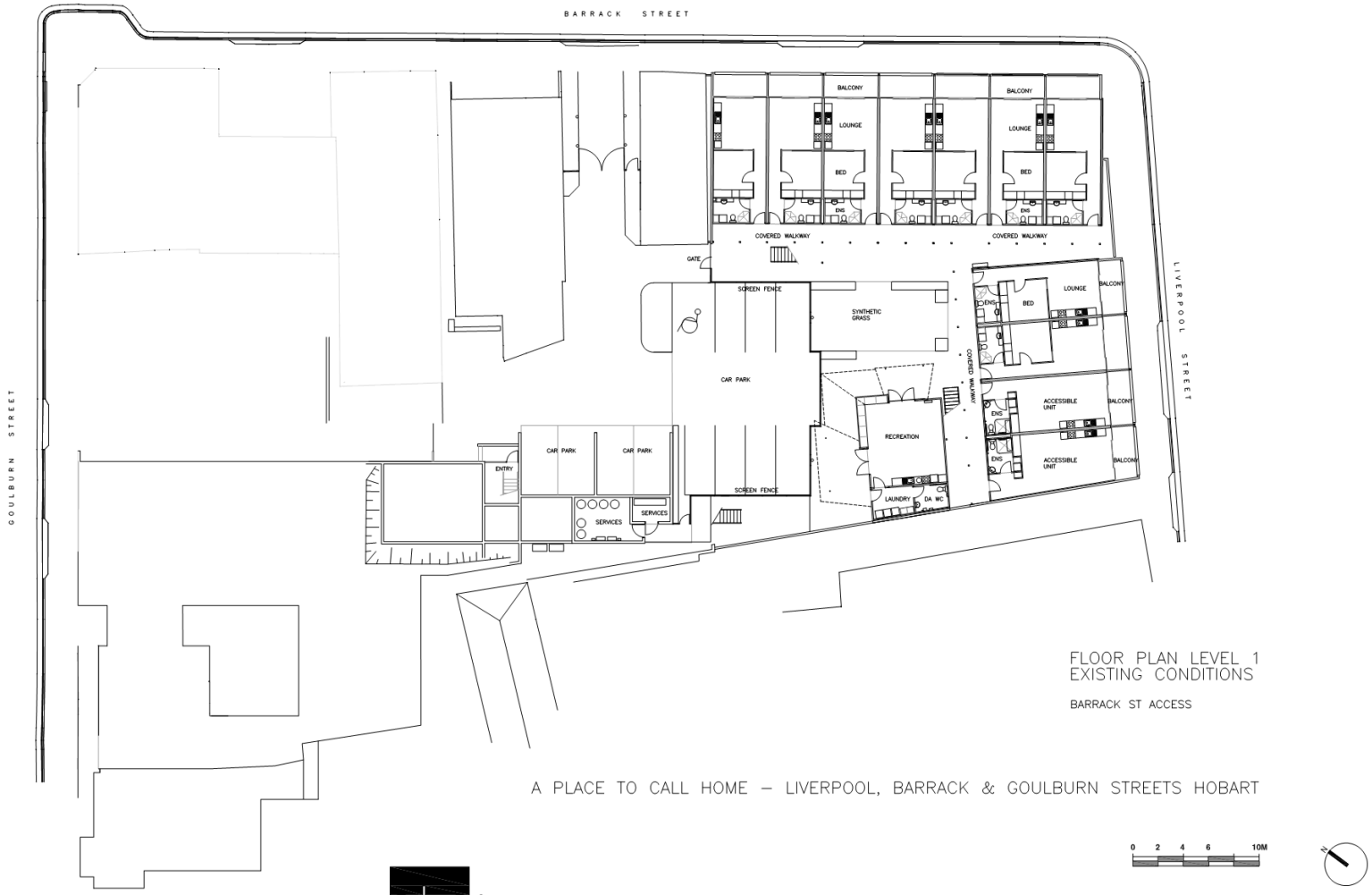
- Anglicare provide 3 full-time equivalent (FTE) workers at Goulburn Street – 1 senior and 2 support workers (8am to 8pm Mon to Friday).

- Additional funding has been provided to provide 1 staff member working 6 hours Saturday (4pm to 10pm) and 6 hours Sunday (9am to 2pm). This is for a 3 month period and has been implemented to address concerns raised by tenants. It is not expected to continue.

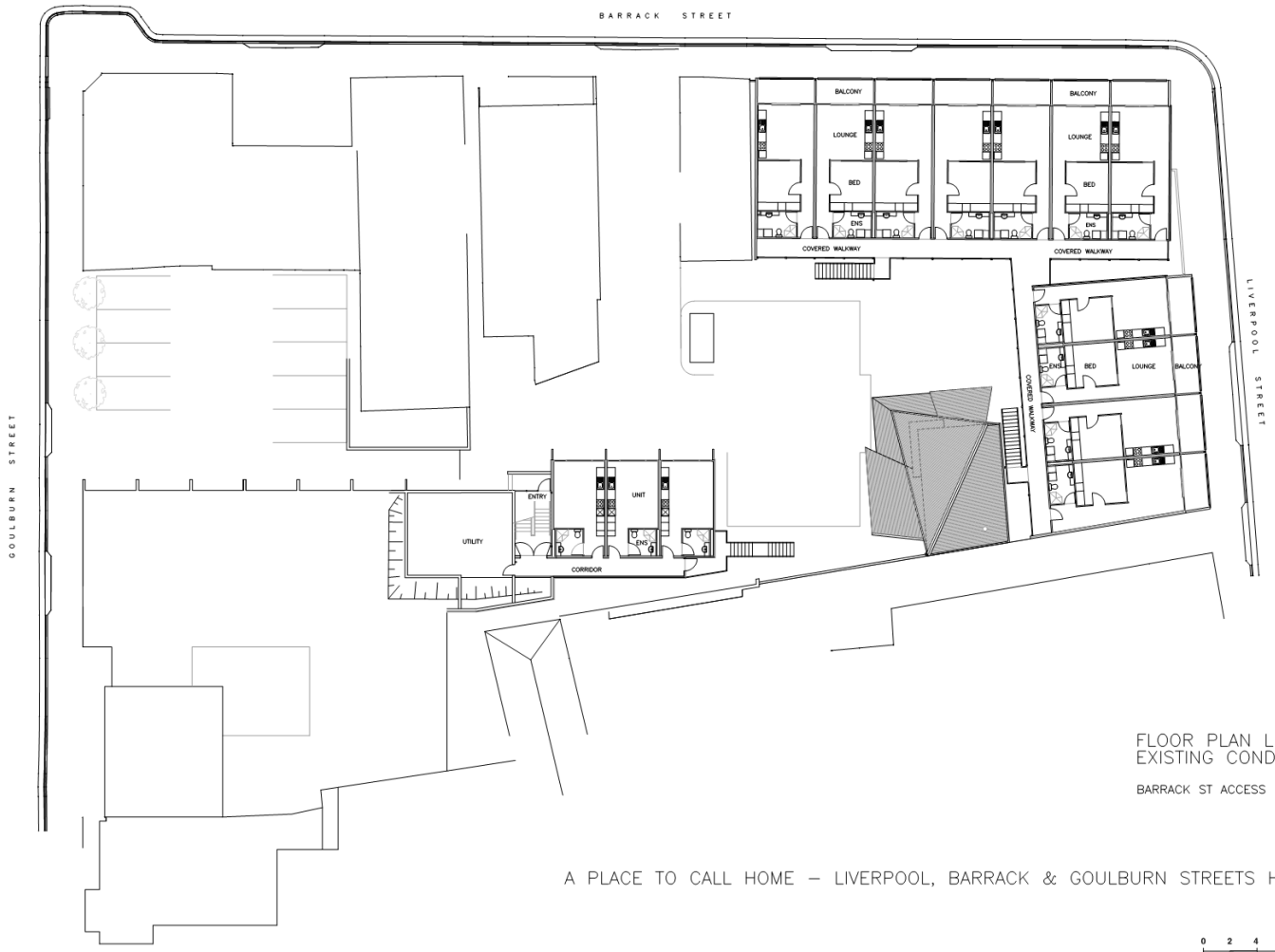
- Anglicare also have 2 security patrols on weeknights (around 9pm and 11pm) 1 on Saturday (around midnight) and 2 on Sunday (6 pm and 10pm).

- There is also the option available to tenants to call security should the need arise outside of the patrol hours. To date the only calls to security have been when tenants have locked their keys in their units.

- The regular security patrols are expected to wind down with the option that tenants will still be able to call security as needed (ie on-call). As with the other facilities Anglicare manage across the state, if there are concerns at any given times Anglicare will arrange ad-hoc patrols. Security services will retain the ability of phoning Anglicare on-call Area Managers if the need arises.



HBV ARCHITECTS
22 SALAMANCA SQUARE, HOBART, TASMANIA, 7004 TEL: (03) 6224 9997 | 52-54 BRISBANE STREET, LEVEL 2, LAUNCESTON, TASMANIA, 7250. TEL: (03) 6334 2468 | EMAIL: hbv@hbvarchitects.com.au



FLOOR PLAN LEVEL 2
EXISTING CONDITIONS

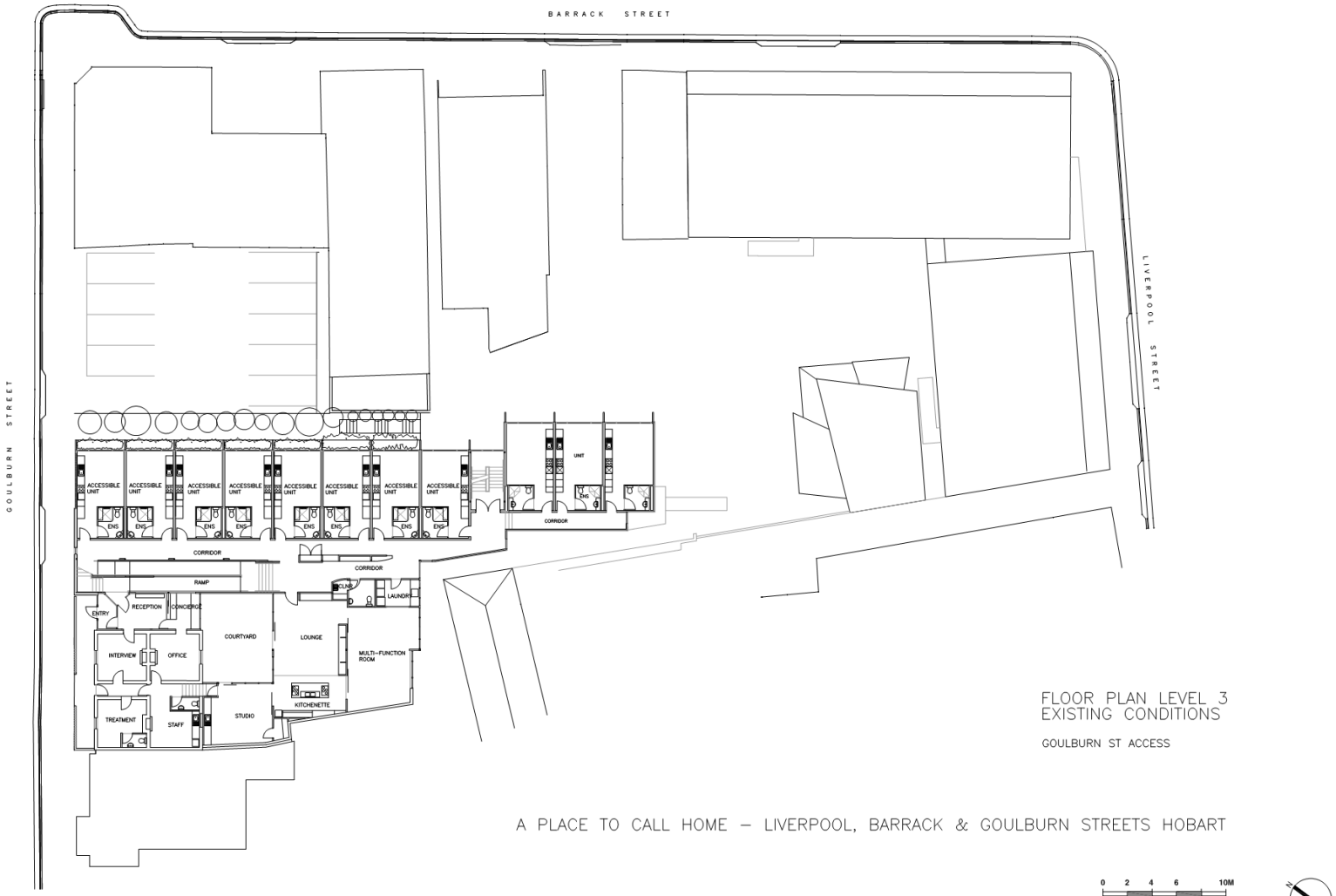
BARRACK ST ACCESS

A PLACE TO CALL HOME – LIVERPOOL, BARRACK & GOULBURN STREETS HOBART

0 2 4 6 10M

HBV ARCHITECTS

22 SALAMANCA SQUARE, HOBART, TASMANIA, 7004 TEL: (03) 6224 9997 | 52-54 BRISBANE STREET, LEVEL 2, LAUNCESTON, TASMANIA, 7250. TEL: (03) 6334 2468 | EMAIL: hbv@hbvarchitects.com.au



FLOOR PLAN LEVEL 3
EXISTING CONDITIONS

GOULBURN ST ACCESS

A PLACE TO CALL HOME – LIVERPOOL, BARRACK & GOULBURN STREETS HOBART

0 2 4 6 10M

HBV ARCHITECTS

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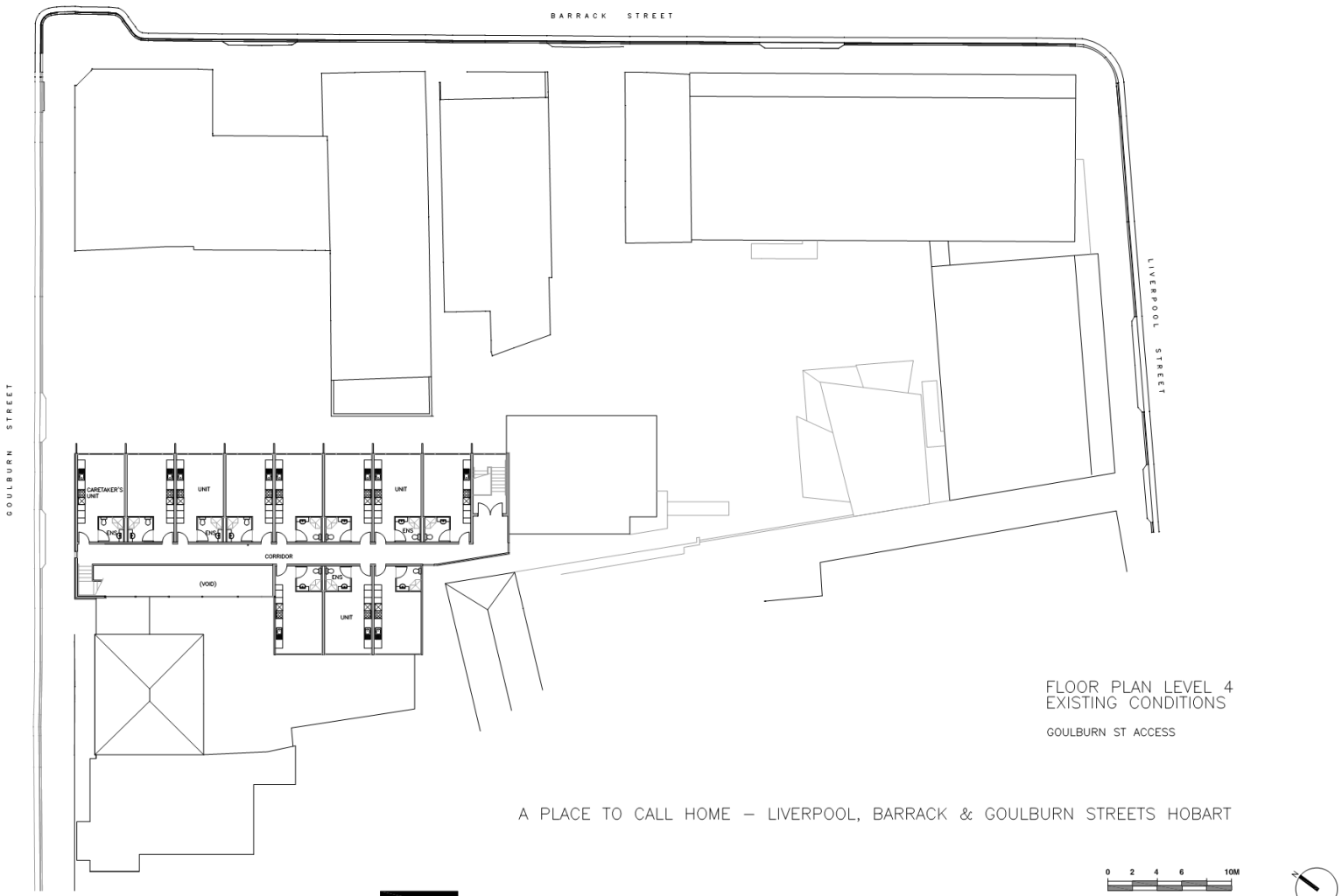


HBV ARCHITECTS 22 SALAMANCA SQUARE, HOBART, TASMANIA, 7004 TEL: (03) 6224 9997 | 52-54 BRISBANE STREET, LEVEL 2, LAUNCESTON, TASMANIA, 7250. TEL: (03) 6334 2468 | EMAIL: hbv@hbvarchitects.com.au

7.2.3 1 - 5 RYDE STREET, NORTH HOBART - PARTIAL DEMOLITION AND ALTERATIONS FOR KIOSK, AND NEW BUILDING FOR COACHES AND MEDIA BOXES PLN-18-738 - FILE REF: F19/770

Address:	1-5 Ryde Street, North Hobart
Proposal:	Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes
Expiry Date:	20 February 2019
Extension of Time:	Not applicable
Author:	Liz Wilson

RECOMMENDATION

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for partial demolition and alterations for kiosk, and new building for coaches and media boxes at 1-5 Ryde Street NORTH HOBART for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GEN

The use and/or development must be substantially in accordance with the documents and drawings that comprise PLN-18-738 - 1-5 RYDE STREET NORTH HOBART TAS 7000 - Final Planning Documents except where modified below.

Reason for condition

To clarify the scope of the permit.

TW

The use and/or development must comply with the requirements of TasWater as detailed in the form Submission to Planning Authority Notice, Reference No. TWDA 2018/01801-HCC dated 19 November 2018 as attached to the permit.

Reason for condition

To clarify the scope of the permit.

PLN s2

The walls of the north elevation of the coaches/media box must be coloured using colours with a light reflectance value not greater than 40 percent prior to the first occupation of the coaches/media box.

Revised plans or details satisfying this requirement must be submitted and approved, prior to the issue of any approval under the *Building Act 2016*.

All work required by this condition must be undertaken in accordance with the approved revised plans.

Advice:

Once the revised plans have been approved, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Where building approval is also required, it is recommended that documentation for condition endorsement be submitted well before submitting documentation for building approval. Failure to address condition endorsement requirements prior to submitting for building approval may result in unexpected delays.

Reason for condition

To ensure that building design contributes positively to adjoining land in a residential zone

ENG sw2.1

The Council's stormwater infrastructure adjacent to / within the subject site must be protected from damage during the construction of the development.

Digital copies of a pre and post construction work CCTV video and associated report(s) of any Council stormwater main within two metres of the works must be submitted to Council:

1. **Prior to issue of any consent under the *Building Act 2016* / the commencement of work, and**
2. **After completion of all work but prior to the issue of any Certificate of Completion.**

The pre and post construction work CCTVs will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner fails to provide to the Council a pre-construction works CCTV video of the Council's infrastructure, then any damage to the Council infrastructure identified in the post construction CCTV will be deemed to be the responsibility of the owner.

Advice: Due to the diameter of the main, a tractor camera will be required to obtain adequately clear footage.

Reason for condition

To ensure that any of the Council infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENG sw3

The proposed works (including foundations and overhangs) must be designed to ensure the long term protection of and access to the Council's stormwater infrastructure.

A detailed design certified by a suitably qualified engineer must be submitted and approved prior to issue of any consent under *Building Act 2016*. The detailed design must:

1. **Demonstrate how the design will ensure the protection of and provide access to the Council's stormwater main.**
2. **Include certification by a suitably qualified engineer (that the works do not impose any loads on the storm water main and the structure is entirely independent of the main and its trenching).**

3. **Demonstrate how adequate access to the main is maintained.**
4. **Demonstrate that no additional loads are imposed on the stormwater main.**
5. **Demonstrate that the structure is entirely independent of the main and its trenching.**
6. **Include (but not be limited to) details of cross-sections, minimum separation, adequate cover.**

Prior to issue of any Certificate of Completion a suitably qualified engineer must confirm the installation of the works within two metres of Council's stormwater main is in accordance with the approved drawings and complies with this condition. Should any remediation works be required, these must be carried out at the developer's cost.

All work required by this condition must be undertaken in accordance with the approved design.

Advice: Once the detailed design drawings has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

As the proposal does not demonstrate the developers intention around the public stormwater infrastructure this condition is required if works are to occur over or within 2 metres of the public stormwater infrastructure. Relaxation of this condition can only be granted by the environmental engineering unit.

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure.

ENG sw4

The development must be drained to Council infrastructure. Any new stormwater connection required must be constructed, and existing redundant connections must be sealed at the owner's expense prior to issue of a Certificate of Completion or first occupation whichever comes first.

Detailed design drawings showing both existing and proposed services must be submitted and approved, prior to issue of any consent under the Building Act 2016 / commencement of work. The detailed design drawings must include:

1. **The location of the proposed connections and all existing connections;**
2. **The size and design of the connection(s) such that they are appropriate to safely service the development given the limited receiving capacity of Council infrastructure;**
3. **Long-sections of the proposed connection(s) clearly showing any nearby services, cover, size, material and delineation of public and private infrastructure;**
4. **Clearly distinguish between public and private infrastructure; and**
5. **Be checked and certified by a qualified and experienced engineer.**

All work required by this condition must be undertaken in accordance with the approved detailed design drawings.

Advice: Once the detailed design drawings have been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Division to initiate an application for service connection.

Any proposed public stormwater infrastructure will require detailed engineering drawings, which must be checked and certified by a qualified and experienced civil engineer. The construction of public infrastructure will require a Permit to Construct Public Infrastructure.

Reason for condition

To ensure the site is drained adequately.

ENG sw5

The new stormwater infrastructure must be constructed and any existing infrastructure made redundant prior to issue of a completion certificate or first occupation, whichever occurs first.

Engineering design drawings must be submitted and approved, prior to commencement of work. The engineering drawings must:

1. **Be certified by a qualified and experienced engineer.**
2. **Show in both plan and long-section the proposed stormwater mains, including but not limited to, connections, flows, velocities, hydraulic grade lines, clearances, cover, gradients, sizing, material, pipe class, adequate working platforms around manholes, easements and inspection openings.**
3. **Include the associated calculations and catchment area plans. The stormwater system (including defined overland flow paths) must cater for all 1% AEP flows as at 2100 (i.e including climate change loading) from a fully developed catchment. The main itself must be sized to accommodate at least the 5% AEP flows from a fully-developed catchment.**
4. **Clearly distinguish between public and private infrastructure.**
5. **Be substantially in accordance with the LGAT drawings.**

All work required by this condition must be undertaken in accordance with the approved engineered drawings.

Advice: Once the engineered drawings has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Division to obtain a Permit to Construct Public Infrastructure.

Reason for condition

To ensure Council's hydraulic infrastructure meets acceptable standards.

ENG 1

The cost of repair of any damage to the Council's infrastructure resulting from the implementation of this permit, must be met by the owners within 30 days of the completion of the development or as otherwise determined by the Council.

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strips, including if any, pre-existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENG s1

Site survey drawings must be submitted and approved, prior to any consent granted under the *Building Act 2016*. The Survey drawings must:

1. **Be certified by a qualified and experienced surveyor.**

2. **Show a site plan of stormwater mains, including but not limited to, location of main and connections, surface levels, invert levels, material, pipe size, manholes, easements and inspection openings.**
3. **Clearly distinguish between public and private infrastructure.**
4. **Show all other infrastructure in the area both private and public, clearly distinguish between public and private.**

All work required by this condition must be undertaken prior to the removal of existing infrastructure or approval of new infrastructure.

Advice: Once the Survey drawings has been accepted the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure, and ensure the continued operation and service of the current stormwater infrastructure.

ENG s2

The cost of any alterations to the Council's or third-party infrastructure, including the site's service connection points, incurred as a result of the proposed development works must be met by the owner / developer.

Reason for condition

To ensure that any of the Council infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENV 1

Sediment and erosion control measures sufficient to prevent sediment from leaving the site must be installed prior to any disturbance of the site, and maintained until all areas of disturbance have been stabilized or re-vegetated.

Advice: For further guidance in preparing a Soil and Water Management Plan – in accordance with Fact sheet 3 Derwent Estuary Program click here.

Reason for condition

To avoid the sedimentation of roads, drains, natural watercourses, Council land that could be caused by erosion and runoff from the development, and to comply with relevant State legislation.

ENVHE 1

Recommendations in the reports *Preliminary Environmental Site Assessment (PSEA) Report* prepared by EM&C and dated 26 August 2018 and *Construction and Environmental Management Plan* prepared by EM&C and dated 27 November 2018 must be implemented.

Reason for condition

To ensure that the risk to future occupants of the building remain low and acceptable.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit the Council's website for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

CONDITION ENDORSEMENT ENGINEERING

All engineering drawings required to be submitted and approved by this planning permit must be submitted to the City of Hobart as a CEP (Condition Endorsement) via the City's Online Service Development Portal. When lodging a CEP, please reference the PLN number of the associated Planning Application. Each CEP must also include an estimation of the cost of works shown on the submitted engineering drawings. Once that estimation has been confirmed by the City's Engineer, the following fees are payable for each CEP submitted and must be paid prior to the City of Hobart commencing assessment of the engineering drawings in each CEP:

Value of Building Works Approved by Planning Permit Fee:

- Up to $20,000: $150 per application.
- Over $20,000: 2% of the value of the works as assessed by the City's Engineer per assessment.

These fees are additional to building and plumbing fees charged under the Building and Plumbing Regulations.

Once the CEP is lodged via the Online Service Development Portal, if the value of building works approved by your planning permit is over $20,000, please contact the City's Development Engineer on 6238 2715 to confirm the estimation of the cost of works shown on the submitted engineering drawings has been accepted.

Once confirmed, pleased call one of the City's Customer Service Officers on 6238 2190 to make payment, quoting the reference number (ie. CEP number) of the Condition Endorsement you have lodged. Once payment is made, your engineering drawings will be assessed.

BUILDING PERMIT

You may need building approval in accordance with the *Building Act 2016.* Click here for more information.

This is a Discretionary Planning Permit issued in accordance with section 57 of the *Land Use Planning and Approvals Act 1993*.

PLUMBING PERMIT

You may need plumbing approval in accordance with the *Building Act 2016*, *Building Regulations 2016* and the National Construction Code. Click here for more information.

SPECIAL CONNECTION PERMIT

You may need a Special Connection Permit (Trade Waste) in accordance with the *Plumbing Regulations 2014* and the Tasmanian Plumbing Code. Click here for more information.

PUBLIC HEALTH

You may be required to provide approved/endorsed plans for a food business fit out, in accordance with the National Construction Code - Building Code of Australia including Tas Part H102 for food premises which must have regard to the FSANZ Food Safety Standards. Click here for more information.

PERMIT TO CONSTRUCT PUBLIC INFRASTRUCTURE

You may require a permit to construct public infrastructure, with a 12 month maintenance period and bond (please contact the Hobart City Council's City Infrastructure Division to initiate the permit process).

NEW SERVICE CONNECTION

Please contact the Hobart City Council's City Infrastructure Division to initiate the application process for your new stormwater connection.

WASTE DISPOSAL

It is recommended that the developer liaise with the Council's Cleansing and Solid Waste Unit regarding reducing, reusing and recycling materials associated with demolition on the site to minimise solid waste being directed to landfill.

Further information regarding waste disposal can also be found on the Council's website.

FEES AND CHARGES

Click here for information on the Council's fees and charges.

DIAL BEFORE YOU DIG

Click here for dial before you dig information.

Attachment A:	PLN-18-738 - 1-5 RYDE STREET NORTH HOBART TAS 7000 - Planning Committee or Delegated Report ⇩
Attachment B:	PLN-18-738 - 1-5 RYDE STREET NORTH HOBART TAS 7000 - CPC Agenda Documents ⇩

City of HOBART

APPLICATION UNDER HOBART INTERIM PLANNING SCHEME 2015

Type of Report:	Committee
Council:	21 January 2019
Expiry Date:	20 February 2019
Application No:	PLN-18-738
Address:	1 - 5 RYDE STREET , NORTH HOBART
Applicant:	Paul Curtain (North Hobart Football Club Ltd) Ryde Street
Proposal:	Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes
Representations:	Nil
Performance criteria:	Development Standards, Potentially Contaminated Land Code

1. Executive Summary

1.1 Planning approval is sought for Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes at North Hobart Oval.

1.2 More specifically the proposal includes:

- Demolition of the existing kiosk and coaches/media box.
- A new building comprising the kiosk, coolroom and wet bar with a roofed terraced area attached.
- A new coaches and media box.
- The new buildings are sited 1.5m from the northern boundary.

1.3 The proposal relies on performance criteria to satisfy the following standards and codes:

1.3.1 Zone Development Standards - Building Height, Setback to Residential Zone, Design & Passive Surveillance.

1.3.2 Potentially Contaminated Land Code

1.4 No representations were received during the statutory advertising period between 11 December and 28 December 2018.

1.5 The proposal is recommended for approval subject to conditions.

1.6 The final decision is delegated to the Council.

2. Site Detail

2.1 The subject site is the North Hobart Oval, specifically an area on the northern side of the site which contains the existing kiosk building, wet area and coaches box/camera box.

Fig. 1. Subject property.

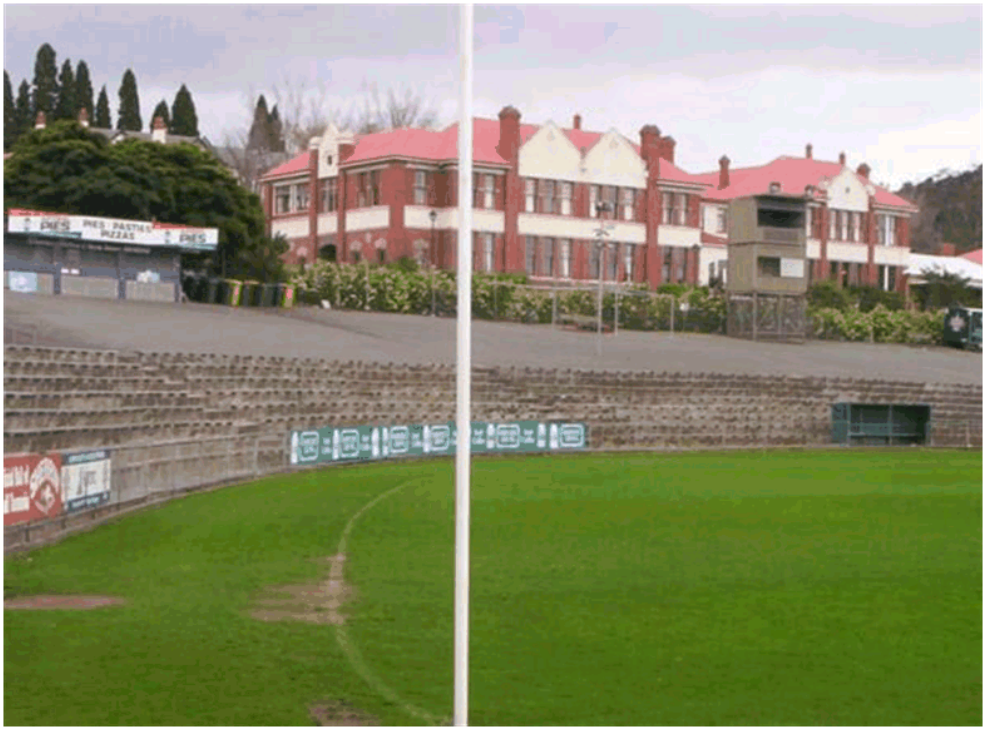


Fig. 2. The existing kiosk is to the left of the photograph and the existing media box is to the right. The new kiosk will be in the same location (but larger). The new coaches and media box will be to the east (right) of the kiosk in the same location as the existing box.

3. Proposal

3.1 Planning approval is sought for Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes at North Hobart Oval.

3.2 More specifically the proposal includes:

- Demolition of the existing kiosk and coaches/media box.
- A new building comprising the kiosk, coolroom and wet bar with a roofed terraced area attached.
- A new coaches and media box.
- The new buildings are sited 1.5m from the northern boundary.

4. Background

4.1 N/A

5. Concerns raised by representors

5.1 No representations were received during the statutory advertising period between 11 December and 28 December 2018.

6. Assessment

6.1 The *Hobart Interim Planning Scheme 2015* is a performance based planning scheme. To meet an applicable standard, a proposal must demonstrate compliance with either an acceptable solution or a performance criterion. Where a proposal complies with a standard by relying on one or more performance criteria, the Council may approve or refuse the proposal on that basis. The ability to approve or refuse the proposal relates only to the performance criteria relied on.

6.2 The site is located within the Recreation Zone of the *Hobart Interim Planning Scheme 2015*.

6.3 The existing and proposed use is sports and recreation, which is a permitted use in the zone.

6.4 The proposal has been assessed against:

6.4.1 Part D - 18.0 Recreation Zone

6.4.2 Part E - 2.0 Potentially Contaminated Land Code

6.4.3 Part E - 7.0 Stormwater Management Code

6.5 The proposal relies on the following performance criteria to comply with the applicable standards:

6.5.1 Building Height – Part D 18.4.1 P2

6.5.2 Setback to a Residential Zone - Part D 18.4.2 P2

6.5.3 Light Reflectance Value - Part D 18.4.3 P2

6.5.4 Passive Surveillance - Part D 18.4.4 P1

6.5.5 Potentially Contaminated Land Code - Part E 2.6.2 P1

6.6 Each performance criterion is assessed below.

6.7 Building Height - Part D 18.4.1 P2

6.7.1 The acceptable solution at clause 18.4.1 A2 requires that the maximum building height within 10m of a residential zone is 8.5m.

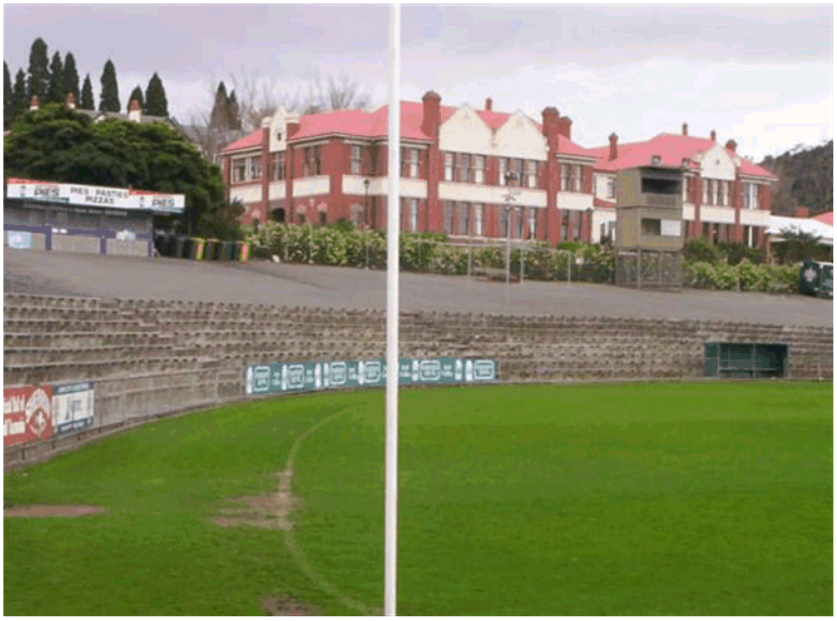
6.7.2 The proposal includes a coaches and media box which is slightly higher at 8.565m, and sited 1.5m from the inner residential zone.

6.7.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.7.4 The performance criterion at clause 18.4.1 P2 provides as follows:

Building height within 10 m of a residential zone must be compatible with the building height of existing buildings on adjoining lots in the residential zone.

6.7.5 The only adjoining lot is 393 Argyle Street, which is Rydges. There are a number of buildings on this site. The closest Rydges building to the coaches/media box is a two storey heritage listed building. The new coaches/media box is a similar size to the existing box which will be demolished, and is compatible in height with the nearest multi-storey building on the Rydges site. The photograph below shows the existing coaches/media box in comparison to the Rydges building beyond.



6.7.6 The proposal complies with the performance criterion.

6.8 Setback to a Residential Zone - Part D 18.4.2 P2

6.8.1 The acceptable solution at clause 18.4.2 A2 requires that set back to a residential zone must be no less than 3.0m or half the height of the wall (whichever is greater).

6.8.2 The proposal includes a new kiosk and coaches/media box which are set back 1.5m from the northern boundary with the inner residential zone. To be permitted, the kiosk should be set back 3.0m and the coaches/media box should be set back 4.3m.

6.8.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.8.4 The performance criterion at clause 18.4.2 P2 provides as follows:

Building setback from a residential zone must be sufficient to prevent unreasonable adverse impacts on residential amenity by:

(a) overshadowing and reduction of sunlight to habitable rooms and private open space on adjoining lots to less than 3 hours between 9.00 am and 5.00 pm on June 21 or further decrease sunlight hours if already less than 3 hours;

(b) overlooking and loss of privacy;
(c) visual impact when viewed from adjoining lots,

taking into account aspect and slope.

6.8.5 The adjacent site is Rydges (393 Argyle Street) which is an accommodation and reception centre. The new kiosk and coaches/media box is separated from the nearest building at 393 Argyle Street by the property's car park. The Rydges buildings are to the north of the kiosk and coaches/media box and so would not be affected by overshadowing. There is no overlooking or loss of privacy, and minimal visual impact. The kiosk is single storey and the coaches/media box while higher, is a relatively small structure and a similar height to the existing coaches/media box.

6.8.6 The proposal complies with the performance criterion.

6.9 Light Reflectance Value - Part D 18.4.3 P2

6.9.1 The acceptable solution at clause 18.4.3 A2 requires that walls facing a residential zone are coloured with colours which have a light reflectance value of not greater than 40%.

6.9.2 The proposal includes a kiosk with a brick wall which meets the acceptable solution. The coaches/media box will be clad in vertical cladding, but the applicants have not decided on the colour of the cladding yet.

6.9.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.9.4 There is no performance criterion.

6.9.5 As there is no performance criterion, the permit will be conditioned so that the acceptable solution is met.

6.10 Passive Surveillance - Part D 18.4.4 P1

6.10.1 The acceptable solution at clause 18.4.4 A1 requires that a building complies with a number of design elements, including that (b) 40% of the surface area of the ground floor level facade is glazed and (c) that 30% of the surface area of the ground floor level facade is glazed where the facade faces a public space.

6.10.2 The proposal includes a new kiosk building whose facade is 17% glazed and a coaches/media box which does not have a ground floor level facade. The only glazing is on the second and third levels.

6.10.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.10.4 The performance criterion at clause 18.4.4 P1 provides as follows:

Buildings design must provide for passive surveillance of public spaces by satisfying all of the following:

(a) provide the main entrance or entrances to a building so that they are clearly visible from nearby buildings and public spaces;

(b) locate windows to adequately overlook the street and adjoining public spaces;

(c) incorporate shop front windows and doors for ground floor shops and offices, so that pedestrians can see into the building and vice versa;

(d) locate external lighting to illuminate any entrapment spaces around the building site;

(e) provide external lighting to illuminate car parking areas and pathways;

(f) design and locate public access to provide high visibility for users and provide clear sight lines between the entrance and adjacent properties and public spaces;

(g) provide for sight lines to other buildings and public spaces.

6.10.5 The proposal requires assessment against (b) and (c). The windows of the kiosk are adequate to overlook the public space between the playing oval and the kiosk and so meets (b). The open sided and covered wet area will provide excellent surveillance. The windows on the second and third levels allow surveillance from the coaches/media box and so meets (b). As neither building is a shop or office, there is no requirement to meet (c).

6.10.6 The proposal complies with the performance criterion.

6.11 Potentially Contaminated Land Code - Part E 2.6.2 P1

6.11.1 There is no acceptable solution for excavation of potentially contaminated land.

6.11.2 The proposal includes excavation of more than 1.5m^2 where the neighbouring property (393 Argyle Street) is listed as potentially contaminated.

6.11.3 There is no acceptable solution; therefore assessment against the performance criterion is relied on.

6.11.4 The performance criterion at clause E.2.6.2 P1 provides as follows:

Excavation does not adversely impact on health and the environment, having regard to:

(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or

(b) a plan to manage contamination and associated risk to human health and the environment that includes:

(i) an environmental site assessment;
(ii) any specific remediation and protection measures required to be implemented before excavation commences; and
(iii) a statement that the excavation does not adversely impact on human health or the environment.

6.11.5 The Council's Environmental Health Officer has advised as follows:

> An Environmental Site Assessment has been submitted that recommended that a CEMP was done. The CEMP was requested and submitted. All recommendations in both documents to be adhered to. Permit to be conditioned to this effect.

6.11.6 The proposal complies with the performance criterion.

7. Discussion

7.1 Planning approval is sought for Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes at North Hobart Oval.

7.2 The application was advertised and no representations were received.

7.3 The proposal has been assessed against the relevant provisions of the planning scheme and is considered to perform well.

7.4 The proposal has been assessed by other Council officers, including the Council's Development Engineer, Environmental Engineer and Environmental Health Officer. The officers have raised no objection to the proposal, subject to conditions.

7.5 The proposal is recommended for approval.

8. Conclusion

8.1 The proposed Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes at 1-5 Ryde Street satisfies the relevant provisions of the *Hobart Interim Planning Scheme 2015*, and as such is recommended for approval.

9. Recommendations

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes at 1-5 Ryde Street NORTH HOBART for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GEN

The use and/or development must be substantially in accordance with the documents and drawings that comprise PLN-18-738 - 1-5 RYDE STREET NORTH HOBART TAS 7000 - Final Planning Documents except where modified below.

Reason for condition

To clarify the scope of the permit.

TW

The use and/or development must comply with the requirements of TasWater as detailed in the form Submission to Planning Authority Notice, Reference No. TWDA 2018/01801-HCC dated 19 November 2018 as attached to the permit.

Reason for condition

To clarify the scope of the permit.

PLN s2

The walls of the north elevation of the coaches/media box must be coloured using colours with a light reflectance value not greater than 40 percent prior to the first occupation of the coaches/media box.

Revised plans or details satisfying this requirement must be submitted and approved, prior to the issue of any approval under the Building Act 2016.

All work required by this condition must be undertaken in accordance with the approved revised plans.

Advice:

Once the revised plans have been approved, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Where building approval is also required, it is recommended that documentation for condition endorsement be submitted well before submitting documentation for building approval. Failure to address condition endorsement requirements prior to submitting for building approval may result in unexpected delays.

Reason for condition

To ensure that building design contributes positively to adjoining land in a residential zone

ENG sw2.1

The Council's stormwater infrastructure adjacent to / within the subject site must be protected from damage during the construction of the development.

Digital copies of a pre and post construction work CCTV video and associated report(s) of any Council stormwater main within two metres of the works must be submitted to Council:

1. **prior to issue of any consent under the Building Act 2016 / the commencement of work, and**
2. **after completion of all work but prior to the issue of any Certificate of Completion.**

The pre and post construction work CCTVs will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner fails to provide to the Council a pre-construction works CCTV video of the Council's infrastructure, then any damage to the Council infrastructure identified in the post construction CCTV will be deemed to be the responsibility of the owner.

Advice: Due to the diameter of the main, a tractor camera will be required to obtain adequately clear footage.

Reason for condition

To ensure that any of the Council infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENG sw3

The proposed works (including foundations and overhangs) must be designed to ensure the long term protection of and access to the Council's stormwater infrastructure.

A detailed design certified by a suitably qualified engineer must be submitted and approved prior to issue of any consent under Building Act 2016. The detailed design must:

1. **Demonstrate how the design will ensure the protection of and provide access to the Council's stormwater main.**
2. **Include certification by a suitably qualified engineer (that the works do not impose any loads on the storm water main and the structure is entirely independent of the main and its trenching).**
3. **Demonstrate how adequate access to the main is maintained.**
4. **Demonstrate that no additional loads are imposed on the stormwater main.**
5. **Demonstrate that the structure is entirely independent of the main and its trenching.**
6. **Include (but not be limited to) details of cross-sections, minimum separation, adequate cover.**

Prior to issue of any Certificate of Completion a suitably qualified engineer must confirm the installation of the works within two metres of Council's stormwater main is in accordance with the approved drawings and complies with this condition. Should any remediation works be required, these must be carried out at the developer's cost.

All work required by this condition must be undertaken in accordance with the approved design.

Advice: Once the detailed design drawings has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

As the proposal does not demonstrate the developers intention around the public stormwater infrastructure this condition is required if works are to occur over or within 2 metres of the public stormwater infrastructure. Relaxation of this condition can only be granted by the environmental engineering unit.

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure.

ENG sw4

The development must be drained to Council infrastructure. Any new stormwater connection required must be constructed, and existing redundant connections must be sealed at the owner's expense prior to issue of a Certificate of Completion or first occupation whichever comes first.

Detailed design drawings showing both existing and proposed services must be submitted and approved, prior to issue of any consent under the Building Act 2016 / commencement of work. The detailed design drawings must include:

1. **the location of the proposed connections and all existing connections;**
2. **the size and design of the connection(s) such that they are appropriate to safely service the development given the limited receiving capacity of Council infrastructure;**
3. **long-sections of the proposed connection(s) clearly showing any nearby services, cover, size, material and delineation of public and private infrastructure; and**
4. **Clearly distinguish between public and private infrastructure**
5. **Be checked and certified by a qualified and experienced engineer.**

All work required by this condition must be undertaken in accordance with the approved detailed design drawings.

Advice: Once the detailed design drawings have been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Division to initiate an application for service connection.

Any proposed public stormwater infrastructure will require detailed engineering drawings, which must be checked and certified by a qualified and experienced Civil Engineer. The construction of public infrastructure will require a Permit to Construct Public Infrastructure.

Reason for condition

To ensure the site is drained adequately

ENG sw5

The new stormwater infrastructure must be constructed and any existing infrastructure made redundant prior to issue of a completion certificate or first occupation, whichever occurs first.

Engineering design drawings must be submitted and approved, prior to commencement of work. The engineering drawings must:

1. **be certified by a qualified and experienced Engineer.**
2. **show in both plan and long-section the proposed stormwater mains, including but not limited to, connections, flows, velocities, hydraulic grade lines, clearances, cover, gradients, sizing, material, pipe class, adequate working platforms around manholes, easements and inspection openings.**
3. **Include the associated calculations and catchment area plans. The stormwater system (including defined overland flow paths) must cater for all 1% AEP flows as at 2100 (i.e including climate change loading) from a fully developed catchment. The main itself must be sized to accommodate at least the 5% AEP flows from a fully-developed catchment.**
4. **Clearly distinguish between public and private infrastructure.**
5. **Be substantially in accordance with the LGAT drawings.**

All work required by this condition must be undertaken in accordance with the approved engineered drawings.

Advice: Once the engineered drawings has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Division to obtain a Permit to Construct Public Infrastructure.

Reason for condition

To ensure Council's hydraulic infrastructure meets acceptable standards.

ENG 1

The cost of repair of any damage to the Council's infrastructure resulting from the implementation of this permit, must be met by the owners within 30 days of the completion of the development or as otherwise determined by the Council.

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strips, including if any, pre-existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENG s1

Site survey drawings must be submitted and approved, prior to any consent granted under the Building Act 2016. The Survey drawings must:

1. **be certified by a qualified and experienced Surveyor.**
2. **Show a site plan of stormwater mains, including but not limited to, location of main and connections, surface levels, invert levels, material, pipe size, manholes, easements and inspection openings.**
3. **Clearly distinguish between public and private infrastructure.**
4. **Show all other infrastructure in the area both private and public, clearly distinguish between public and private.**

All work required by this condition must be undertaken prior to the removal of existing infrastructure or approval of new infrastructure.

Advice: Once the Survey drawings has been accepted the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure, and ensure the continued operation and service of the current stormwater infrastructure.

ENG s2

The cost of any alterations to the Council's or third-party infrastructure, including the site's service connection points, incurred as a result of the proposed development works must be met by the owner / developer.

Reason for condition

To ensure that any of the Council infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENV 1

Sediment and erosion control measures sufficient to prevent sediment from leaving the site must be installed prior to any disturbance of the site, and maintained until all areas of disturbance have been stabilized or re-vegetated.

Advice: For further guidance in preparing a Soil and Water Management Plan – in accordance with Fact sheet 3 Derwent Estuary Program click here.

Reason for condition

To avoid the sedimentation of roads, drains, natural watercourses, Council land that could be caused by erosion and runoff from the development, and to comply with relevant State legislation.

ENVHE 1

Recommendations in the reports *Preliminary Environmental Site Assessment (PSEA) Report* prepared by EM&C and dated 26 August 2018 and *Construction and Environmental Management Plan* prepared by EM&C and dated 27 November 2018 must be implemented.

Reason for condition

To ensure that the risk to future occupants of the building remain low and acceptable.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit the Council's website for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

CONDITION ENDORSEMENT ENGINEERING

All engineering drawings required to be submitted and approved by this planning permit must be submitted to the City of Hobart as a CEP (Condition Endorsement) via the City's Online Service Development Portal. When lodging a CEP, please reference the PLN number of the associated Planning Application. Each CEP must also include an estimation of the cost of works shown on the submitted engineering drawings. Once that estimation has been confirmed by the City's Engineer, the following fees are payable for each CEP submitted and must be paid prior to the City of Hobart commencing assessment of the engineering drawings in each CEP:

Value of Building Works Approved by Planning Permit Fee:

- Up to $20,000: $150 per application.
- Over $20,000: 2% of the value of the works as assessed by the City's Engineer per assessment.

These fees are additional to building and plumbing fees charged under the Building and Plumbing Regulations.

Once the CEP is lodged via the Online Service Development Portal, if the value of building works approved by your planning permit is over $20,000, please contact the City's Development Engineer on 6238 2715 to confirm the estimation of the cost of works shown on the submitted engineering drawings has been accepted.

Once confirmed, pleased call one of the City's Customer Service Officers on 6238 2190 to make payment, quoting the reference number (ie. CEP number) of the Condition Endorsement you have lodged. Once payment is made, your engineering drawings will be assessed.

BUILDING PERMIT

You may need building approval in accordance with the *Building Act 2016*. Click here for more information.

This is a Discretionary Planning Permit issued in accordance with section 57 of the *Land Use Planning and Approvals Act 1993*.

PLUMBING PERMIT

You may need plumbing approval in accordance with the *Building Act 2016*, *Building Regulations 2016* and the National Construction Code. Click here for more information.

SPECIAL CONNECTION PERMIT

You may need a Special Connection Permit (Trade Waste) in accordance with the *Plumbing Regulations 2014* and the Tasmanian Plumbing Code. Click here for more information.

PUBLIC HEALTH

You may be required to provide approved/endorsed plans for a food business fit out, in accordance with the National Construction Code - Building Code of Australia including Tas Part H102 for food premises which must have regard to the FSANZ Food Safety Standards. Click here for more information.

PERMIT TO CONSTRUCT PUBLIC INFRASTRUCTURE

You may require a permit to construct public infrastructure, with a 12 month maintenance period and bond (please contact the Hobart City Council's City Infrastructure Division to initiate the permit process).

NEW SERVICE CONNECTION

Please contact the Hobart City Council's City Infrastructure Division to initiate the application process for your new stormwater connection.

WASTE DISPOSAL

It is recommended that the developer liaise with the Council's Cleansing and Solid Waste Unit regarding reducing, reusing and recycling materials associated with demolition on the site to minimise solid waste being directed to landfill.

Further information regarding waste disposal can also be found on the Council's website.

FEES AND CHARGES

Click here for information on the Council's fees and charges.

DIAL BEFORE YOU DIG

Click here for dial before you dig information.

(Liz Wilson)
Development Appraisal Planner

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Rohan Probert)
Manager Development Appraisal

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 2 January 2019

Attachment(s):

Attachment B - CPC Agenda Documents

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-18-738	Council notice date	5/11/2018
TasWater details			
TasWater Reference No.	TWDA 2018/01801-HCC	Date of response	19/11/2018
TasWater Contact	Rachael Spencer Greg Cooper (TRADE WASTE)	Phone No.	03 6345 6346 03 6237 8280
Response issued to			
Council name	HOBART CITY COUNCIL		
Contact details	coh@hobartcity.com.au		
Development details			
Address	1-5 RYDE ST, NORTH HOBART	Property ID (PID)	2003969
Description of development	Partial demolition and alterations for kiosk and new building for coaches and media boxes		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Smeekes Drafting	Plan No NHOK 004	-	10/10/16

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections / sewerage system and connection to each the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.

TRADE WASTE

2. Prior to the commencement of operation the developer/property owner must obtain Consent to discharge Trade Waste from TasWater.
3. The developer must install appropriately sized and suitable pre-treatment devices prior to gaining Consent to discharge.
4. The Developer/property owner must comply with all TasWater conditions prescribed in the Trade Waste Consent.

DEVELOPMENT ASSESSMENT FEES

5. The applicant or landowner as the case may be, must pay a development assessment fee of $211.63 to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date paid to TasWater.

   The payment is required within 30 days of the issue of an invoice by TasWater.

Advice

General

For information on TasWater development standards, please visit
http://www.taswater.com.au/Development/Development-Standards

For application forms please visit http://www.taswater.com.au/Development/Forms

Trade Waste

Prior to any Building and/or Plumbing work being undertaken, the applicant will need to make an application to TasWater for a Certificate for Certifiable Work (Building and/or Plumbing). The Certificate for Certifiable Work (Building and/or Plumbing) must accompany all documentation submitted to Council.
Documentation must include a floor and site plan with:
Location of all pre-treatment devices i.e. grease arrestor;
Schematic drawings and specification (including the size and type) of any proposed pre-treatment device and drainage design; and
Location of an accessible sampling point in accordance with the TasWater Trade Waste Flow Meter and Sampling Specifications for sampling discharge.
Details of the proposed use of the premises, including the types of food that will be prepared and served; and
The estimated number of patrons and/or meals on a daily basis.
At the time of submitting the Certificate for Certifiable Work (Building and/or Plumbing) a Trade Waste Application form is also required.
If the nature of the business changes or the business is sold, TasWater is required to be informed in order to review the pre-treatment assessment.
The application forms are available at http://www.taswater.com.au/Customers/Liquid-Trade-waste/Commercial

Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

Authorised by

Jason Taylor
Development Assessment Manager

TasWater Contact Details			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

City of HOBART

Enquiries to: Shannon Avery
☎: (03) 6238 2882
✉: coh@hobartcity.com.au
Our Ref: PLN-18-738/ 2003969

2 November 2018

Mr Paul Curtain
General Manager
North Hobart Football Club

Via Email: gm@nhfc@net.au

Dear Mr Curtain,

NOTICE OF LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	1-5 Ryde Street North Hobart (North Hobart Oval)
Description of Proposal:	Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes.
Applicant Name:	North Hobart Football Club Ltd
PLN *(if applicable)*:	PLN-18-738

I write to advise that pursuant to Section 52 of the *Land Use Planning and Approvals Act 1993*, I grant my consent on behalf of the Hobart City Council as the owner/administrator of the above land for you to make application to the City for a planning permit for the development described above and as per the attached documents.

Please note that the granting of the consent is only for the making of the application and in no way should such consent be seen as prejudicing any decision the Council is required to make as the statutory planning authority or as the owner/administrator of the land.

Yours faithfully,

(N D Heath)
GENERAL MANAGER

Attachment: Land Owner Consent

City of HOBART

2003969

LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	1-5 Ryde Street North Hobart (North Hobart Oval)
Description of Proposal:	Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes.
Applicant Name:	North Hobart Football Club Ltd
PLN *(if applicable)*:	PLN-18-738

The land indicated above is owned by the Hobart City Council.

The applicant proposes to lodge an application for a permit, pursuant to the *Land Use Planning and Approvals Act 1993,* in respect to the proposal described above.

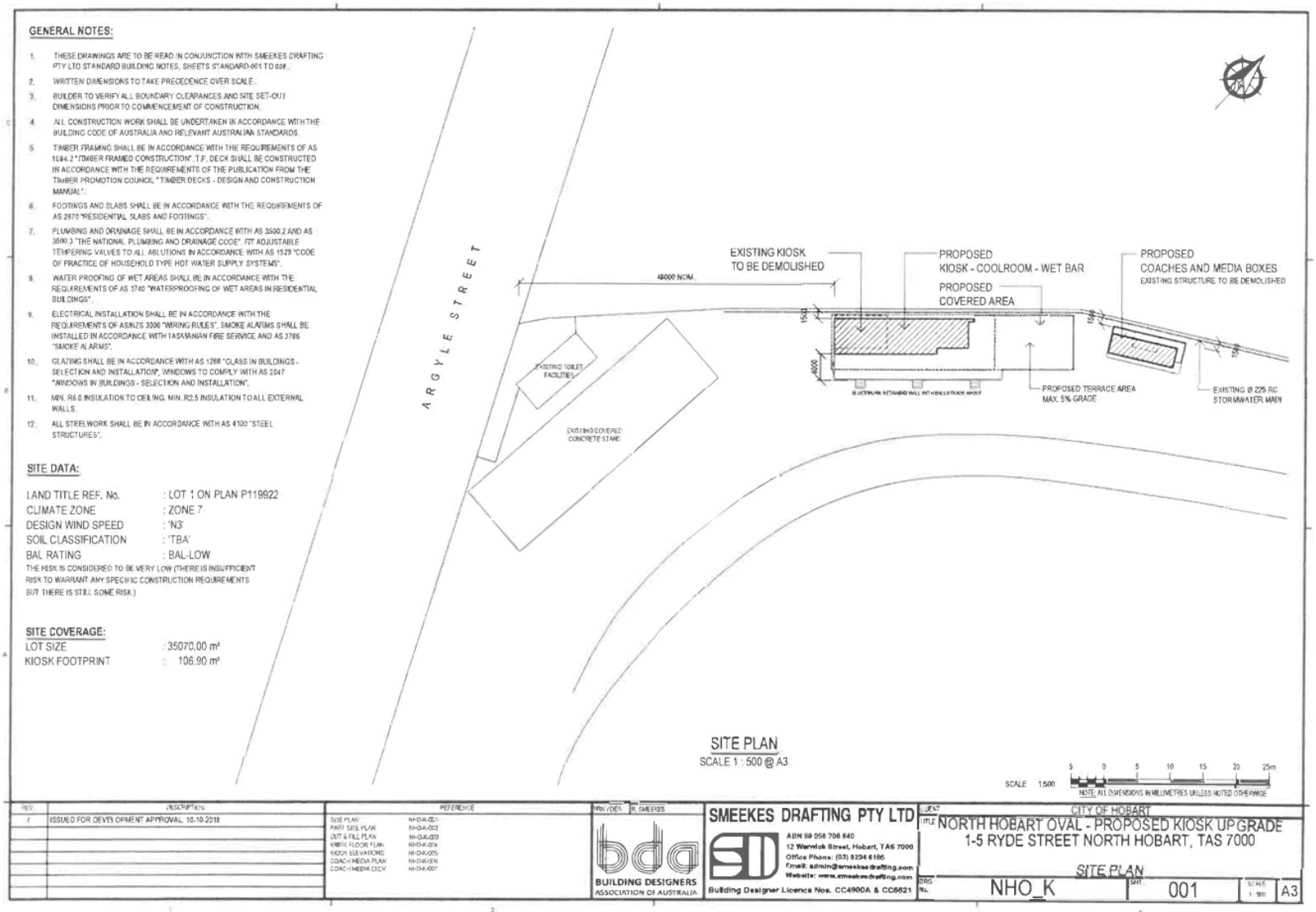
Part or all of the application proposes use and/or development on land owned or administered by the City located at 1-5 Ryde Street North Hobart (as shown on the attached plans).
Being and as General Manager of the Hobart City Council, I provide written permission to the making of the application pursuant to Section 52(1B)(b) of the *Land Use Planning and Approvals Act 1993.*

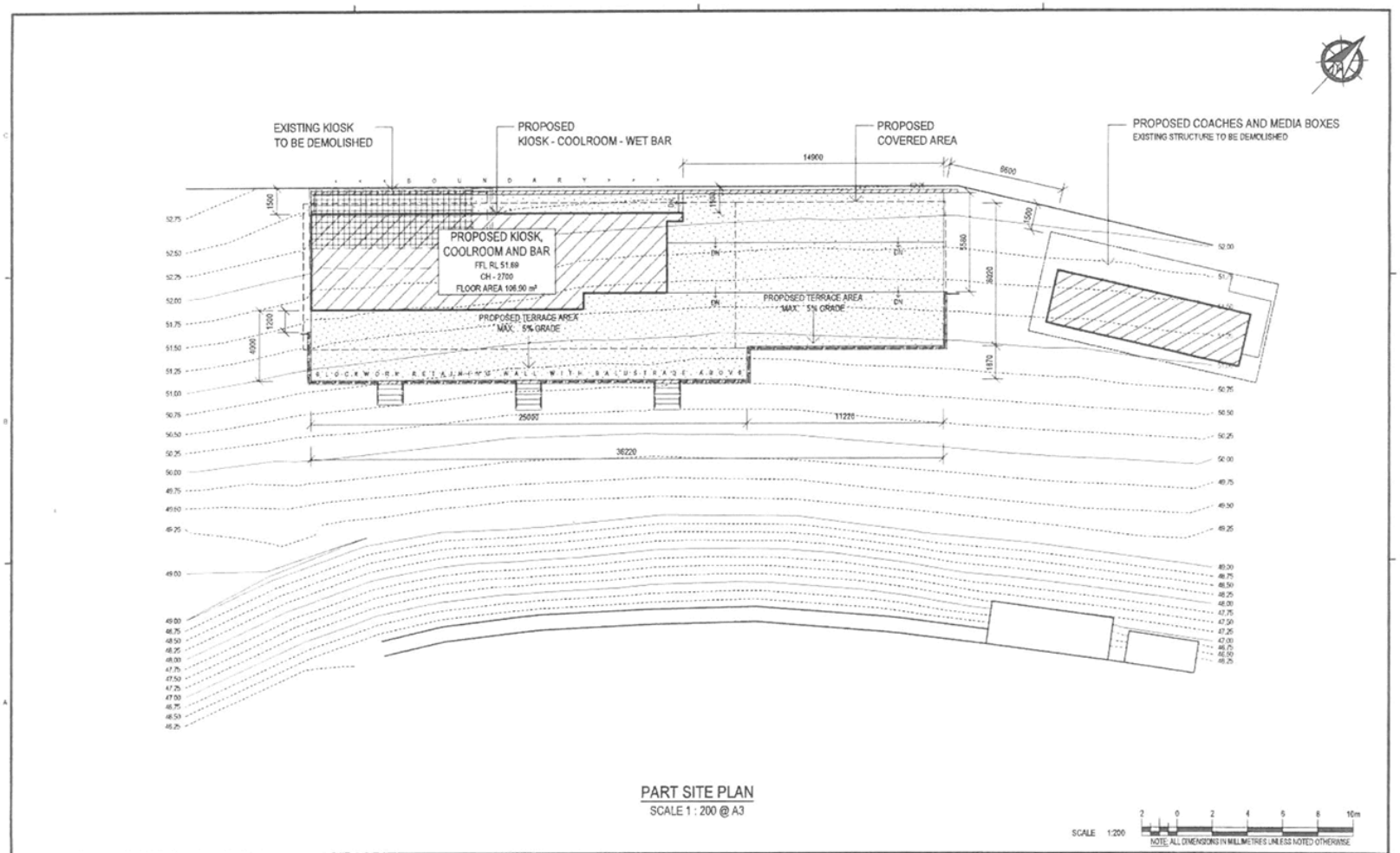
(N D Heath)
GENERAL MANAGER

Date: 2/11/18

This consent is for the making of a planning application only, and does not constitute landlord consent for the development to occur.

Attachments/Plans:


GENERAL NOTES:
1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SMEEKES DRAFTING PTY LTD STANDARD BUILDING NOTES, SHEETS STANDARD-001 TO 008.
2. WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALE.
3. BUILDER TO VERIFY ALL BOUNDARY CLEARANCES AND SITE SET-OUT DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ALL CONSTRUCTION WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND RELEVANT AUSTRALIAN STANDARDS.
5. TIMBER FRAMING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 1684.2 "TIMBER FRAMED CONSTRUCTION". T.P. DECK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLICATION FROM THE TIMBER PROMOTION COUNCIL " TIMBER DECKS - DESIGN AND CONSTRUCTION MANUAL".
6. FOOTINGS AND SLABS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 2870 "RESIDENTIAL SLABS AND FOOTINGS".
7. PLUMBING AND DRAINAGE SHALL BE IN ACCORDANCE WITH AS 3500.2 AND AS 3500.3 "THE NATIONAL PLUMBING AND DRAINAGE CODE". FIT ADJUSTABLE TEMPERING VALVES TO ALL ABLUTIONS IN ACCORDANCE WITH AS 1529 "CODE OF PRACTICE OF HOUSEHOLD TYPE HOT WATER SUPPLY SYSTEMS".
8. WATER PROOFING OF WET AREAS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 3740 "WATERPROOFING OF WET AREAS IN RESIDENTIAL BUILDINGS".
9. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 3000 "WIRING RULES". SMOKE ALARMS SHALL BE INSTALLED IN ACCORDANCE WITH TASMANIAN FIRE SERVICE AND AS 3786 "SMOKE ALARMS".
10. GLAZING SHALL BE IN ACCORDANCE WITH AS 1288 "GLASS IN BUILDINGS - SELECTION AND INSTALLATION". WINDOWS TO COMPLY WITH AS 2047 "WINDOWS IN BUILDINGS - SELECTION AND INSTALLATION".
11. MIN. R6.0 INSULATION TO CEILING. MIN. R2.5 INSULATION TO ALL EXTERNAL WALLS.
12. ALL STEELWORK SHALL BE IN ACCORDANCE WITH AS 4100 "STEEL STRUCTURES".
SITE DATA:
LAND TITLE REF. No. : LOT 1 ON PLAN P119922
CLIMATE ZONE : ZONE 7
DESIGN WIND SPEED : 'N3'
SOIL CLASSIFICATION : 'TBA'
BAL RATING : BAL-LOW
THE RISK IS CONSIDERED TO BE VERY LOW (THERE IS INSUFFICIENT RISK TO WARRANT ANY SPECIFIC CONSTRUCTION REQUIREMENTS BUT THERE IS STILL SOME RISK.)
SITE COVERAGE:
LOT SIZE : 35070.00 m²
KIOSK FOOTPRINT : 106.90 m²
ARGYLE STREET
48000 NOM.
EXISTING KIOSK TO BE DEMOLISHED
PROPOSED KIOSK - COOLROOM - WET BAR
PROPOSED COVERED AREA
PROPOSED COACHES AND MEDIA BOXES
EXISTING STRUCTURE TO BE DEMOLISHED
1500
4000
EXISTING TOILET FACILITIES
EXISTING COVERED CONCRETE STAND
ELECTRICAL RETAINING WALL NOT DETAILED ABOVE
PROPOSED TERRACE AREA MAX. 5% GRADE
EXISTING Ø 225 RC STORMWATER MAIN
SITE PLAN
SCALE 1 : 500 @ A3
SCALE 1:500
5 0 5 10 15 20 25m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE
REV. DESCRIPTION
F ISSUED FOR DEVELOPMENT APPROVAL 10-10-2018
REFERENCE
SITE PLAN NH-DA-001
PART SITE PLAN NH-DA-002
CUT & FILL PLAN NH-DA-003
KIOSK FLOOR PLAN NH-DA-004
KIOSK ELEVATIONS NH-DA-005
COACH MEDIA PLAN NH-DA-006
COACH MEDIA ELEV NH-DA-007
PROVIDER R. SMEEKES
BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA
SMEEKES DRAFTING PTY LTD
ABN 80 058 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621
CLIENT CITY OF HOBART
TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
SITE PLAN
DRG No. NHO_K
SHT. 001
SCALE 1:500
A3



PART SITE PLAN
SCALE 1 : 200 @ A3

SCALE 1:200 — 2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL, 10-10-2018

REFERENCE	
SITE PLAN	NHO-A-001
PART SITE PLAN	NHO-A-002
CUT & FILL PLAN	NHO-A-003
KIOSK FLOOR PLAN	NHO-A-004
KIOSK ELEVATIONS	NHO-A-005
COACH MEDIA PLAN	NHO-A-006
COACH MEDIA ELEV	NHO-A-007

DRN RDES R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
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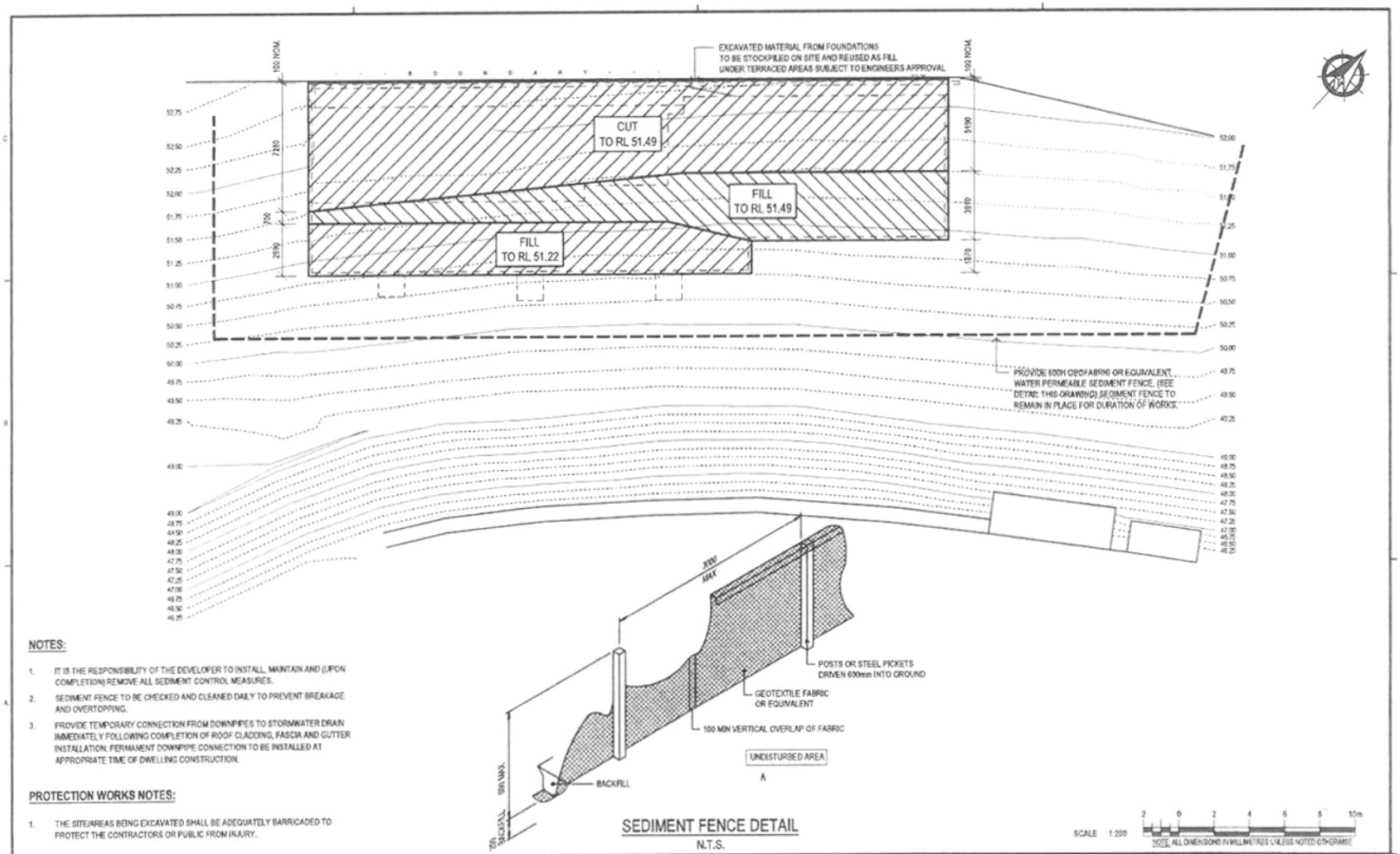
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT CITY OF HOBART
TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

PART SITE PLAN

JOB NO. NHO_K | SHT 002 | SCALE 1:200 | A3



NOTES:

1. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL, MAINTAIN AND (UPON COMPLETION) REMOVE ALL SEDIMENT CONTROL MEASURES.
2. SEDIMENT FENCE TO BE CHECKED AND CLEANED DAILY TO PREVENT BREAKAGE AND OVERTOPPING.
3. PROVIDE TEMPORARY CONNECTION FROM DOWNPIPES TO STORMWATER DRAIN IMMEDIATELY FOLLOWING COMPLETION OF ROOF CLADDING, FASCIA AND GUTTER INSTALLATION. PERMANENT DOWNPIPE CONNECTION TO BE INSTALLED AT APPROPRIATE TIME OF DWELLING CONSTRUCTION.

PROTECTION WORKS NOTES:

1. THE SITE/AREAS BEING EXCAVATED SHALL BE ADEQUATELY BARRICADED TO PROTECT THE CONTRACTORS OR PUBLIC FROM INJURY.

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 10-10-2018

REFERENCE	
SITE PLAN	NHO-A-001
PART SITE PLAN	NHO-A-002
CUT & FILL PLAN	NHO-A-003
KIOSK FLOOR PLAN	NHO-A-004
KIOSK ELEVATIONS	NHO-A-005
COACH MEDIA PLAN	NHO-A-006
COACH MEDIA ELEV	NHO-A-007

DRAWN R. SMEEKES

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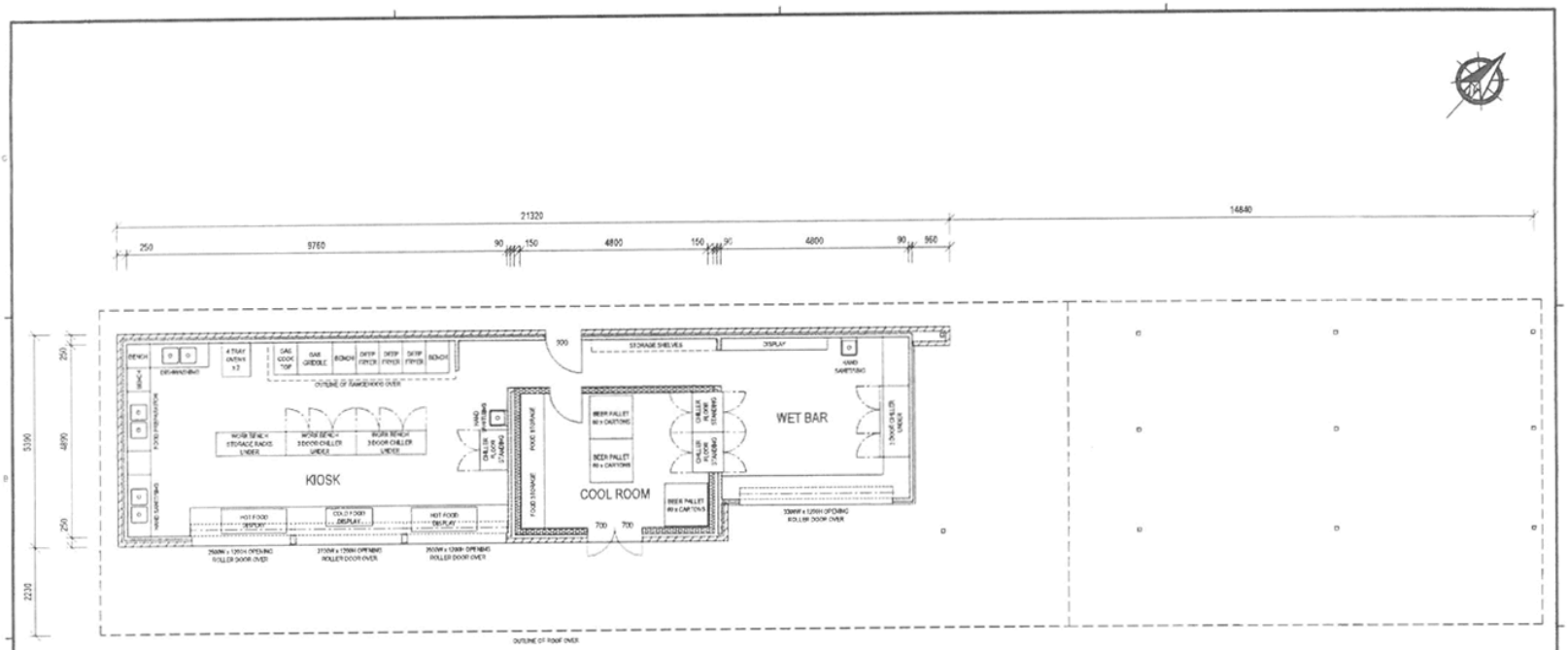
SMEEKES DRAFTING PTY LTD
ABN 89 055 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6021

CLIENT CITY OF HOBART

TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
CUT AND FILL PLAN /
SOIL AND WATER MANAGEMENT PLAN

JOB No. NHO_K | SHT. 003 | SCALE 1:200 | A3



FLOOR PLAN
SCALE 1 : 100 @ A3

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

WINDOW LEGEND:

1509 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

A - AWNING
BF - BIFOLD DOOR
C - CUSTOM (BUTTED CORNER GLAZING)
F - FIXED
FR - FROSTED GLAZING
GB - GLASS BRICK
H - HINGED DOOR
S - SLIDING
SD - SLIDING DOOR
STKSD - STACKING TYPE SLIDING DOOR

FLOOR FINISHES LEGEND:

C - CARPET
CT - CERAMIC TILES
L - LINOLEUM
NC - NATURAL CONCRETE

SCALE 1:100
1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL, 10-10-2016

REFERENCE	
SITE PLAN	NHO-A-001
PART SITE PLAN	NHO-A-002
CUT & FILL PLAN	NHO-A-003
KIOSK FLOOR PLAN	NHO-A-004
KIOSK ELEVATIONS	NHO-A-005
COACH MEDIA PLAN	NHO-A-006
COACH MEDIA ELEV	NHO-A-007

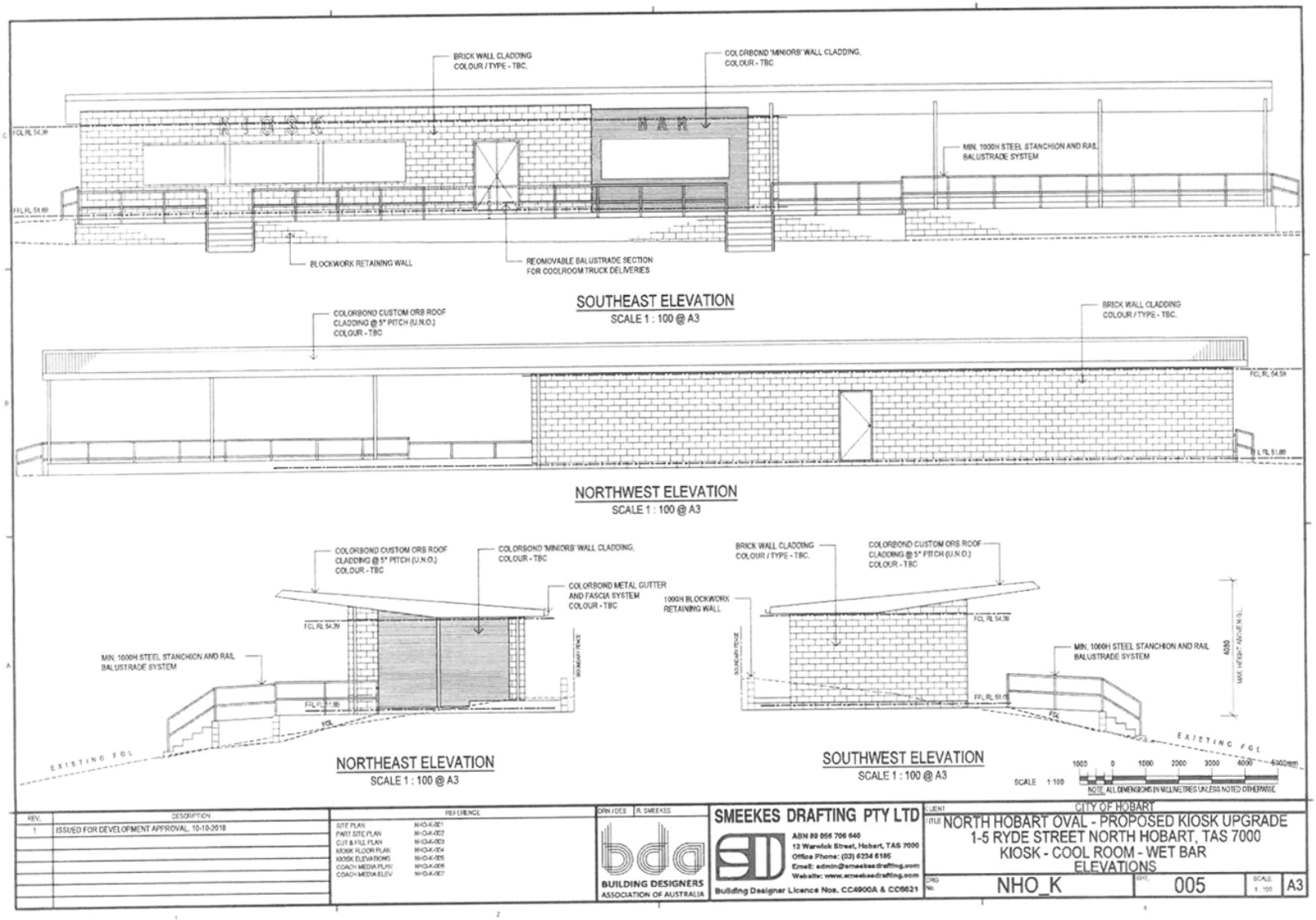
DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 058 706 840
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
FLOOR PLAN

JOB NO.: NHO_K | SHT.: 004 | SCALE: 1:100 | A3


BRICK WALL CLADDING
COLOUR / TYPE - TBC.
COLORBOND 'MINIORB' WALL CLADDING,
COLOUR - TBC
KIOSK
BAR
MIN. 1000H STEEL STANCHION AND RAIL
BALUSTRADE SYSTEM
FCL RL 54.39
FFL RL 51.69
BLOCKWORK RETAINING WALL
REMOVABLE BALUSTRADE SECTION
FOR COOLROOM TRUCK DELIVERIES
SOUTHEAST ELEVATION
SCALE 1 : 100 @ A3
COLORBOND CUSTOM ORB ROOF
CLADDING @ 5° PITCH (U.N.O.)
COLOUR - TBC
BRICK WALL CLADDING
COLOUR / TYPE - TBC.
FCL RL 54.59
FFL RL 51.89
NORTHWEST ELEVATION
SCALE 1 : 100 @ A3
COLORBOND CUSTOM ORB ROOF
CLADDING @ 5° PITCH (U.N.O.)
COLOUR - TBC
COLORBOND 'MINIORB' WALL CLADDING,
COLOUR - TBC
COLORBOND METAL GUTTER
AND FASCIA SYSTEM
COLOUR - TBC
MIN. 1000H STEEL STANCHION AND RAIL
BALUSTRADE SYSTEM
FCL RL 54.39
FFL RL 51.69
BOUNDARY FENCE
EXISTING FGL
NORTHEAST ELEVATION
SCALE 1 : 100 @ A3
BRICK WALL CLADDING
COLOUR / TYPE - TBC.
COLORBOND CUSTOM ORB ROOF
CLADDING @ 5° PITCH (U.N.O.)
COLOUR - TBC
1000H BLOCKWORK
RETAINING WALL
FCL RL 54.39
MIN. 1000H STEEL STANCHION AND RAIL
BALUSTRADE SYSTEM
FFL RL 51.69
BOUNDARY FENCE
EXISTING FGL
SOUTHWEST ELEVATION
SCALE 1 : 100 @ A3
SCALE 1:100
1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
REV. 1
DESCRIPTION: ISSUED FOR DEVELOPMENT APPROVAL, 10-10-2018
REFERENCE
SITE PLAN NHO-K-001
PART SITE PLAN NHO-K-002
CUT & FILL PLAN NHO-K-003
KIOSK FLOOR PLAN NHO-K-004
KIOSK ELEVATIONS NHO-K-005
COACH MEDIA PLAN NHO-K-006
COACH MEDIA ELEV NHO-K-007
DRN / DES R. SMEEKES
BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA
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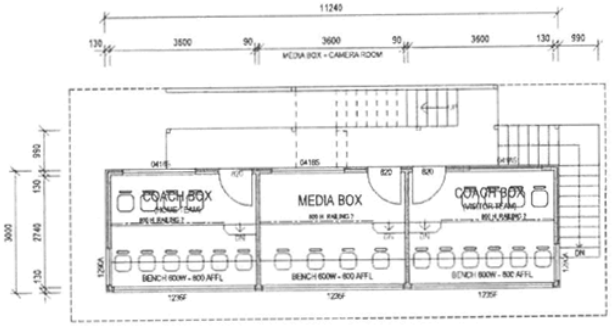
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621
CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
ELEVATIONS
JOB NO. NHO_K
SHT. 005
SCALE 1:100
A3

LEVEL 2 (CAMERA ROOM) FLOOR PLAN
SCALE 1 : 100 @ A3



LEVEL 1 (COACHES + MEDIA) FLOOR PLAN
SCALE 1 : 100 @ A3

FLOOR FINISHES LEGEND:

- C - CARPET
- CT - CERAMIC TILES
- L - LINOLEUM
- NC - NATURAL CONCRETE

WINDOW LEGEND:

1509 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

- A - AWNING
- BF - BIFOLD DOOR
- C - CUSTOM (BUTTED CORNER GLAZING)
- F - FIXED
- FR - FROSTED GLAZING
- GB - GLASS BRICK
- H - HINGED DOOR
- S - SLIDING
- SD - SLIDING DOOR
- STKSD - STACKING TYPE SLIDING DOOR

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

SCALE 1:100 — 1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL, 10-10-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

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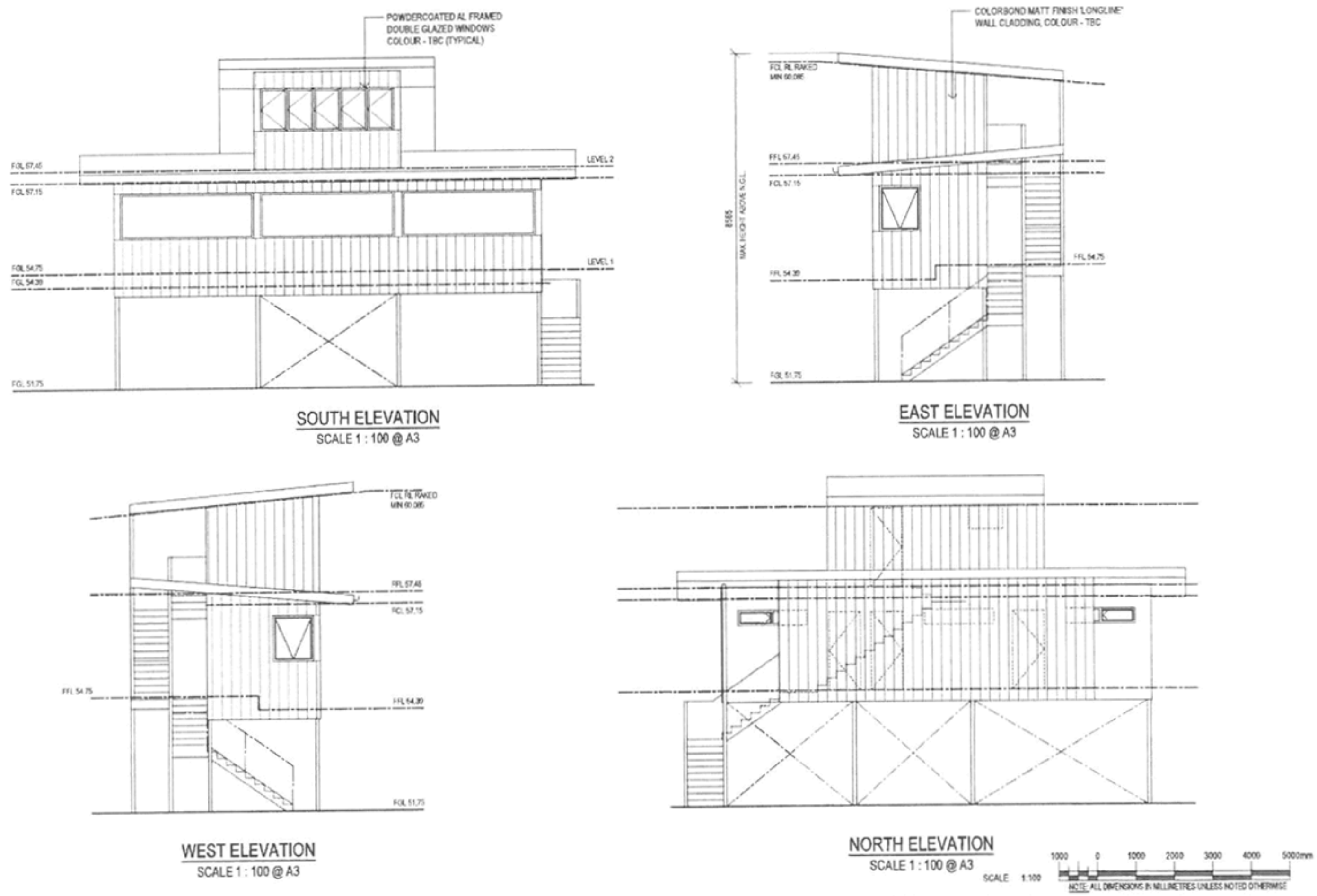
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6521

CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
FLOOR PLANS

DWG NO.	SHT	SCALE	
NHO_K	006	1:100	A3



REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL, 10-10-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
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12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
ELEVATIONS

DRG No.: NHO_K | SHT.: 007 | SCALE: 1:100 | A3

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
119922	1
EDITION	DATE OF ISSUE
1	01-Sep-1995

SEARCH DATE : 22-Oct-2018
SEARCH TIME : 12.39 PM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Plan 119922
Derivation : Whole of Lot 36692 Gtd. to The Lord Mayor, Alderman & Citizens of the City of Hobart
Prior CT 3499/56

SCHEDULE 1

HOBART CITY COUNCIL

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
The said land iwthin described was granted unto and to the use of the Grantee in fee simple to be held on condition to use, subject to the provision of the Hobart Corporation Act 1963 for the recreation, amusement, health and enjoyment of the inhabitantsof the City of Hobart and other persons resident in or coming into the said City.

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

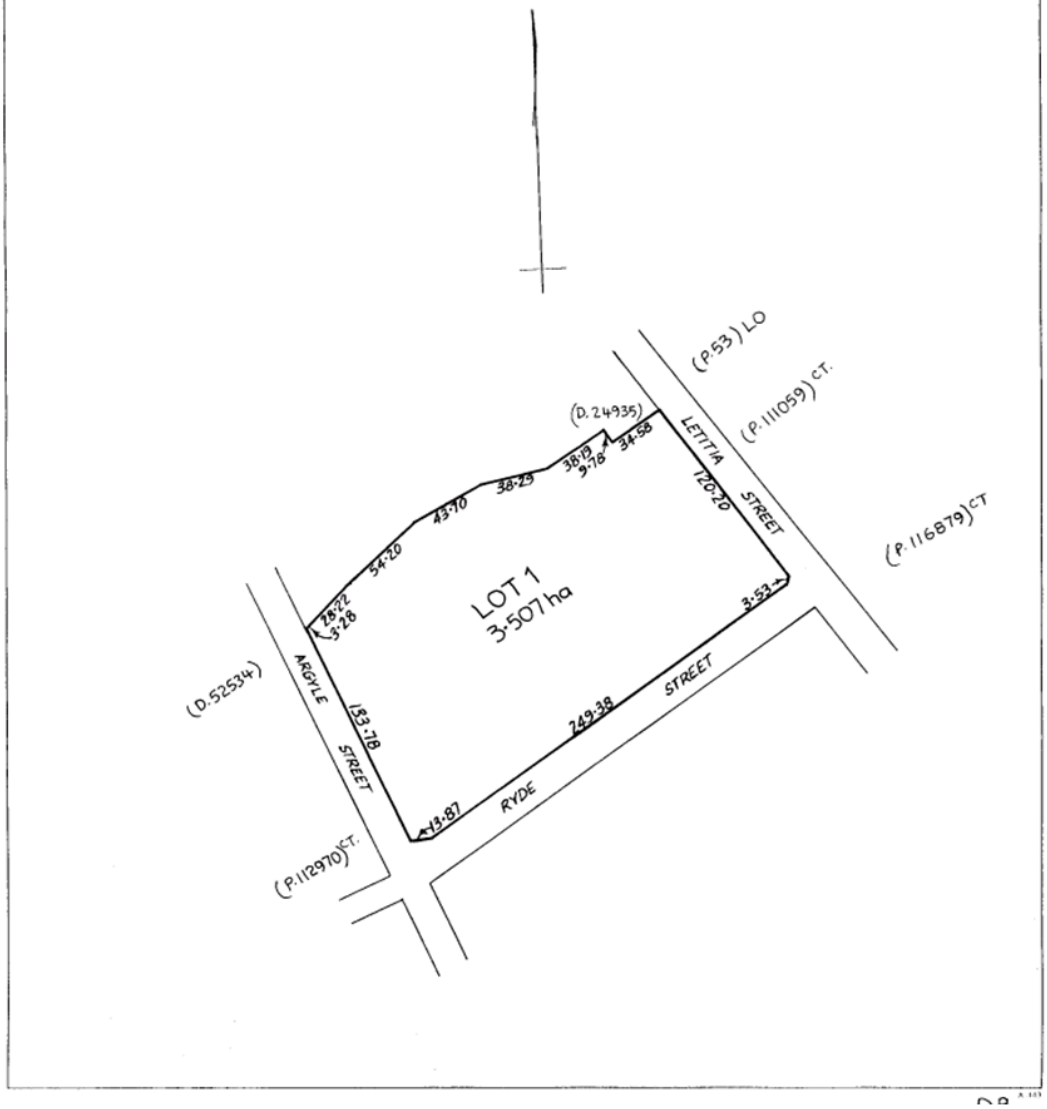
FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

OWNER FOLIO REFERENCE CT 3499/56 GRANTEE	PLAN OF TITLE LOCATION CITY OF HOBART FIRST SURVEY PLAN No. (D9/30)LO (D5/16&17)LO (P.1724 L.D.) COMPILED BY LTO SCALE 1: 2500 LENGTHS IN METRES	REGISTERED NUMBER P 119922 APPROVED 07 AUG 1995 Recorder of Titles
MAPSHEET MUNICIPAL CODE No. 114	LAST UPI No 2103351	LAST PLAN No.
ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN		

BALANCE PLAN



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
24935	1
EDITION	DATE OF ISSUE
2	30-Jun-2015

SEARCH DATE : 22-Oct-2018
SEARCH TIME : 12.39 PM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Diagram 24935
Derivation : Part of Lot 38843 Gtd. to Royal Tasmanian Society for the Blind & Deaf
Prior CT 4286/55

SCHEDULE 1

HOBART CITY COUNCIL

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

D

Owner: Royal Tasmanian Society for the Blind and Deaf.

Title Reference: C.T. 3956-17

Grantee: Part of 1.207ha ~~vested in~~ LOT 38643 GRANTED TO ~~the~~ Royal Tasmanian Society for the Blind and Deaf.

PLAN OF SURVEY

by Surveyor D. A. Parkes.

of land situated in the

CITY OF HOBART.

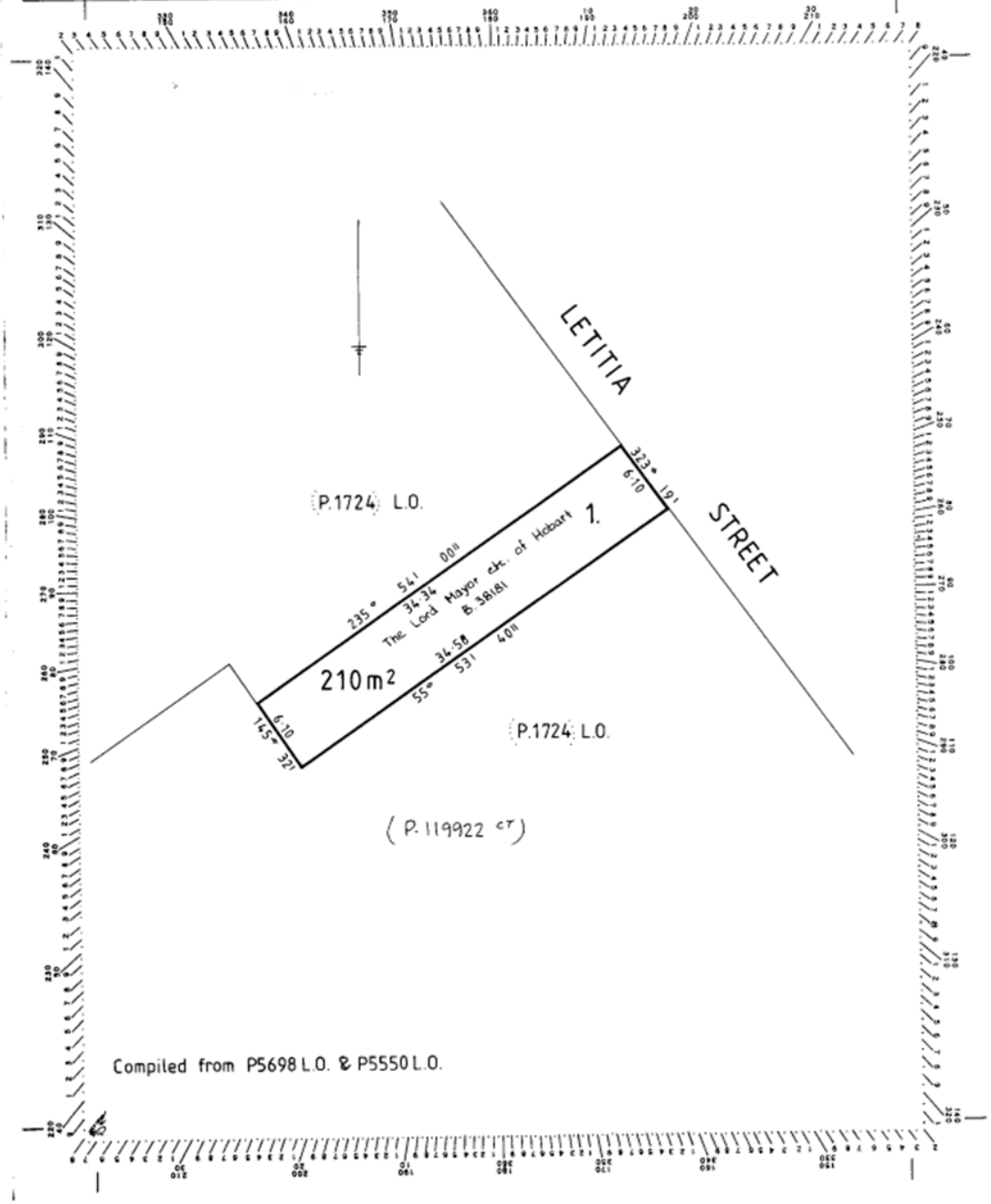
SCALE 1: 300 MEASUREMENTS IN METRES

Registered Number: D24935

Approved ~~Effective from:~~ 30 OCT 1985

E. R. Thorp

Recorder of Titles



GENERAL NOTES:

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SMEEKES DRAFTING PTY LTD STANDARD BUILDING NOTES, SHEETS STANDARD-001 TO 008.
2. WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALE.
3. BUILDER TO VERIFY ALL BOUNDARY CLEARANCES AND SITE SET-OUT DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ALL CONSTRUCTION WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND RELEVANT AUSTRALIAN STANDARDS.
5. TIMBER FRAMING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 1684.2 "TIMBER FRAMED CONSTRUCTION". T.P. DECK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLICATION FROM THE TIMBER PROMOTION COUNCIL " TIMBER DECKS - DESIGN AND CONSTRUCTION MANUAL".
6. FOOTINGS AND SLABS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 2870 "RESIDENTIAL SLABS AND FOOTINGS".
7. PLUMBING AND DRAINAGE SHALL BE IN ACCORDANCE WITH AS 3500.2 AND AS 3500.3 "THE NATIONAL PLUMBING AND DRAINAGE CODE". FIT ADJUSTABLE TEMPERING VALVES TO ALL ABLUTIONS IN ACCORDANCE WITH AS 1529 "CODE OF PRACTICE OF HOUSEHOLD TYPE HOT WATER SUPPLY SYSTEMS".
8. WATER PROOFING OF WET AREAS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 3740 "WATERPROOFING OF WET AREAS IN RESIDENTIAL BUILDINGS".
9. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 3000 "WIRING RULES". SMOKE ALARMS SHALL BE INSTALLED IN ACCORDANCE WITH TASMANIAN FIRE SERVICE AND AS 3786 "SMOKE ALARMS".
10. GLAZING SHALL BE IN ACCORDANCE WITH AS 1288 "GLASS IN BUILDINGS - SELECTION AND INSTALLATION", WINDOWS TO COMPLY WITH AS 2047 "WINDOWS IN BUILDINGS - SELECTION AND INSTALLATION".
11. MIN. R6.0 INSULATION TO CEILING. MIN. R2.5 INSULATION TO ALL EXTERNAL WALLS.
12. ALL STEELWORK SHALL BE IN ACCORDANCE WITH AS 4100 "STEEL STRUCTURES".

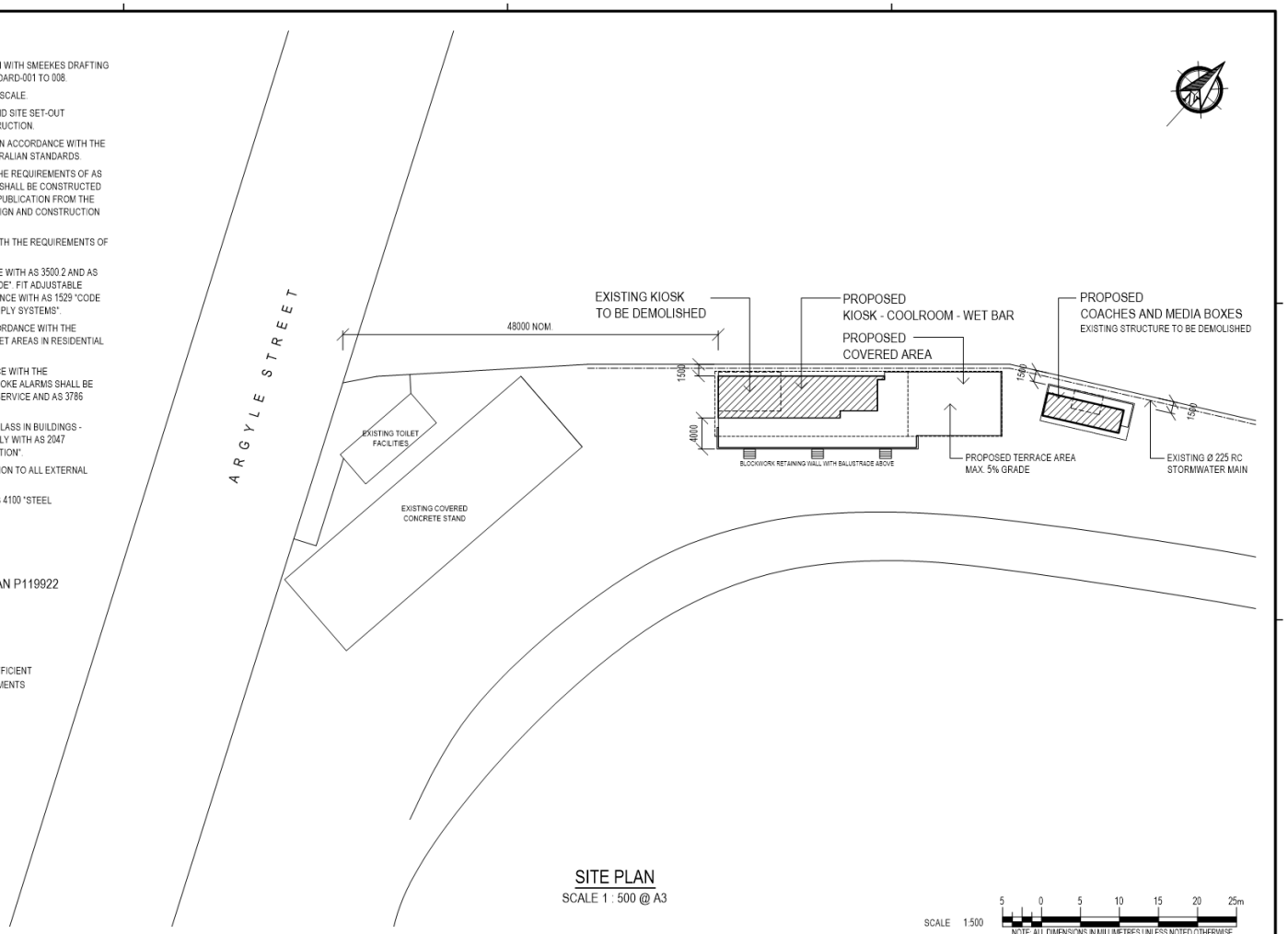
SITE DATA:

LAND TITLE REF. No.	: LOT 1 ON PLAN P119922
CLIMATE ZONE	: ZONE 7
DESIGN WIND SPEED	: 'N3'
SOIL CLASSIFICATION	: 'TBA'
BAL RATING	: BAL-LOW

THE RISK IS CONSIDERED TO BE VERY LOW (THERE IS INSUFFICIENT RISK TO WARRANT ANY SPECIFIC CONSTRUCTION REQUIREMENTS BUT THERE IS STILL SOME RISK.)

SITE COVERAGE:

LOT SIZE	: 35070.00 m²
KIOSK FOOTPRINT	: 106.90 m²



SITE PLAN
SCALE 1 : 500 @ A3

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 10-10-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
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KIOSK ELEVATIONS	NHO-K-005
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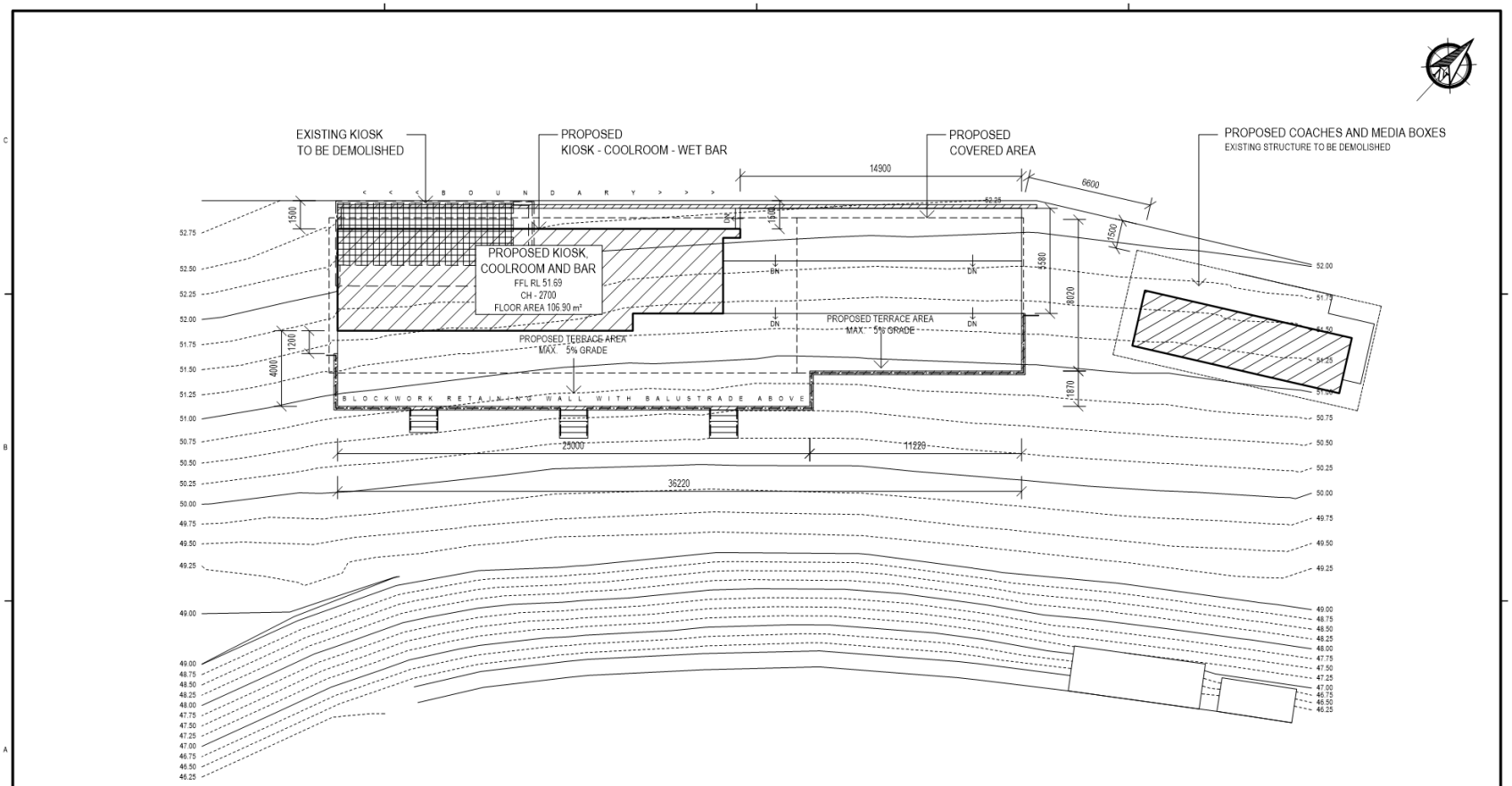
CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

SITE PLAN

ORG No.	SHT.	SCALE	
NHO_K	001	1 : 500	A3



PART SITE PLAN
SCALE 1 : 200 @ A3

SCALE 1:200 2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 10-10-2018

REFERENCE	
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PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
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CLIENT CITY OF HOBART
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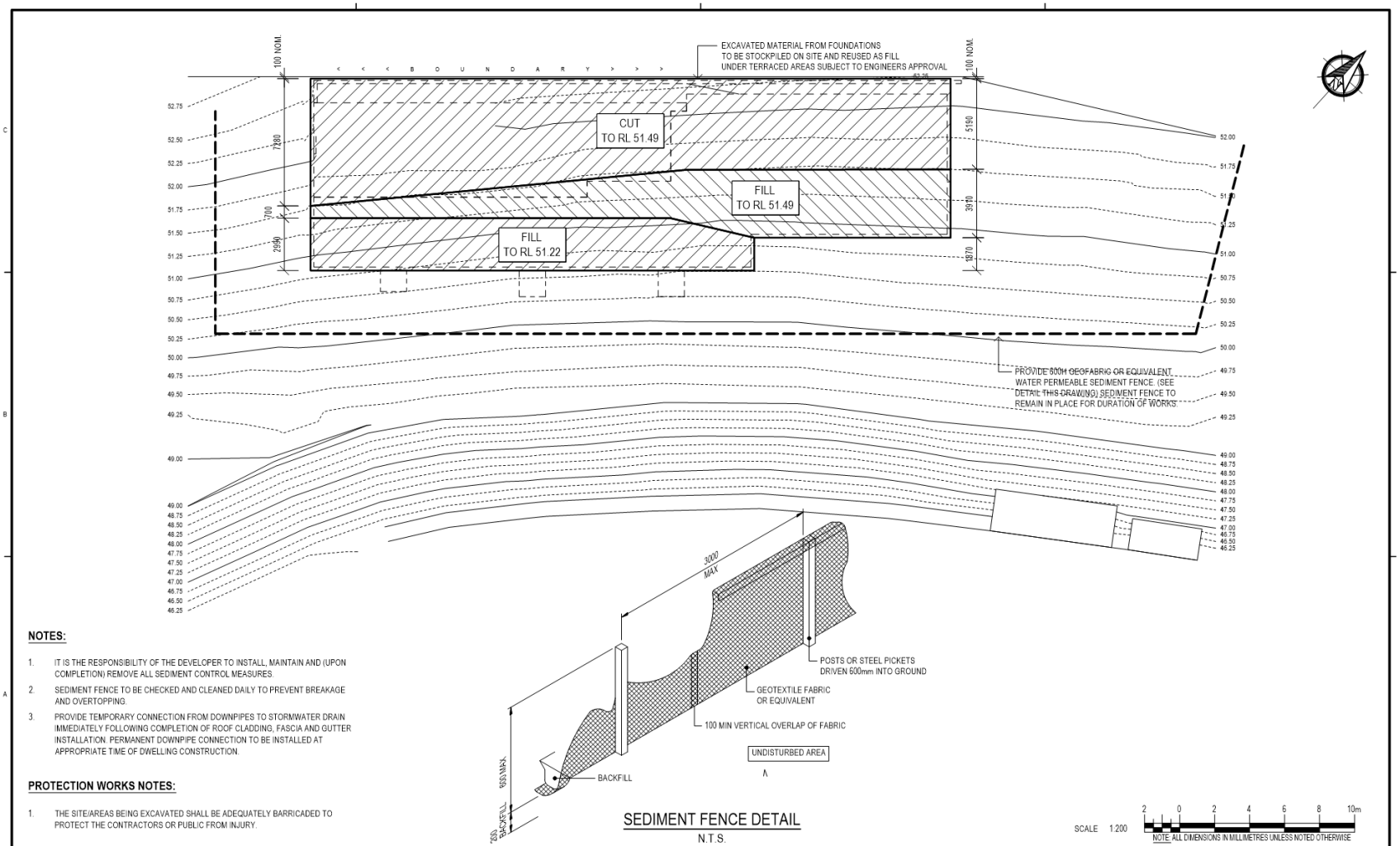
1-5 RYDE STREET NORTH HOBART, TAS 7000
PART SITE PLAN
ORG No. NHO_K
SHT. 002
SCALE 1 : 200
A3



NOTES:

1. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL, MAINTAIN AND (UPON COMPLETION) REMOVE ALL SEDIMENT CONTROL MEASURES.
2. SEDIMENT FENCE TO BE CHECKED AND CLEANED DAILY TO PREVENT BREAKAGE AND OVERTOPPING.
3. PROVIDE TEMPORARY CONNECTION FROM DOWNPIPES TO STORMWATER DRAIN IMMEDIATELY FOLLOWING COMPLETION OF ROOF CLADDING, FASCIA AND GUTTER INSTALLATION. PERMANENT DOWNPIPE CONNECTION TO BE INSTALLED AT APPROPRIATE TIME OF DWELLING CONSTRUCTION.

PROTECTION WORKS NOTES:

1. THE SITE/AREAS BEING EXCAVATED SHALL BE ADEQUATELY BARRICADED TO PROTECT THE CONTRACTORS OR PUBLIC FROM INJURY.

SEDIMENT FENCE DETAIL
N.T.S.

SCALE 1:200
2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 10-10-2018

REFERENCE	
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PART SITE PLAN	NHO-K-002
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KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
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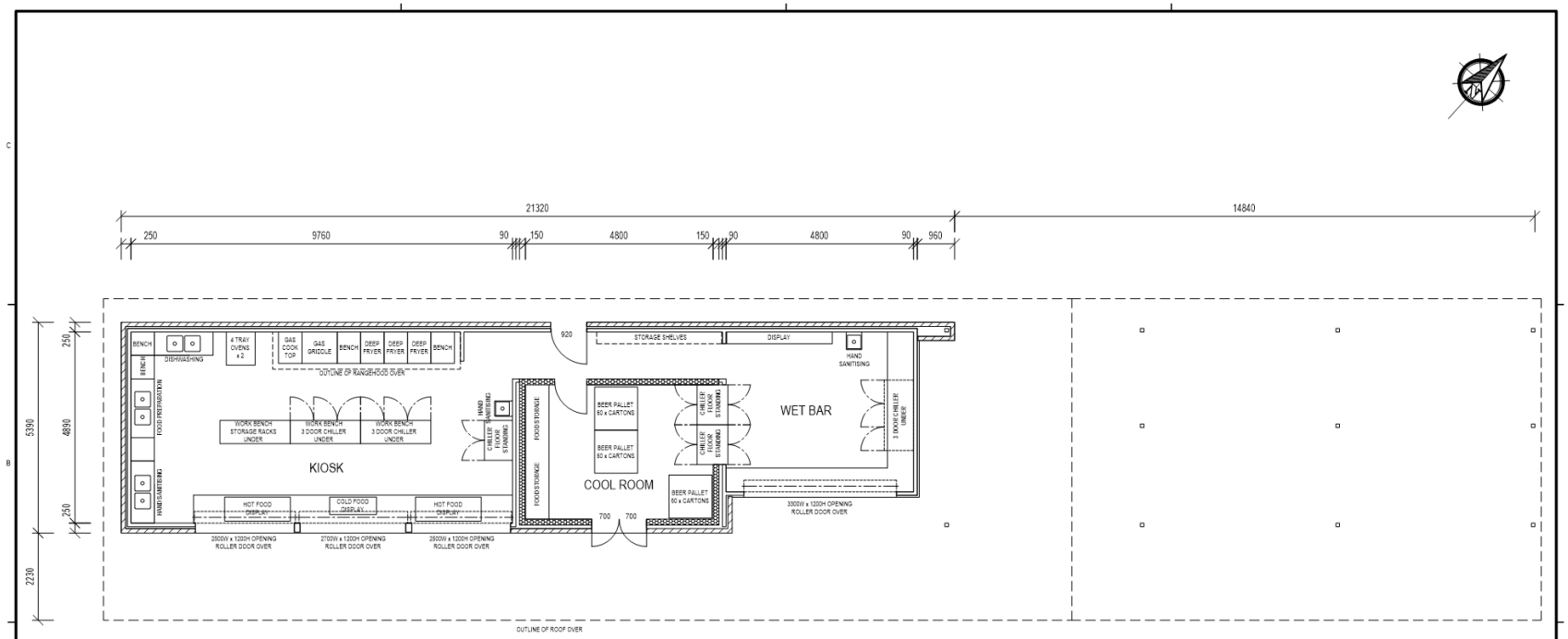
CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
CUT AND FILL PLAN /
SOIL AND WATER MANAGEMENT PLAN

ORG No.: NHO_K | SHT: 003 | SCALE: 1:200 | A3



FLOOR PLAN
SCALE 1 : 100 @ A3

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

A - AWNING
BF - BIFOLD DOOR
C - CUSTOM (BUTTED CORNER GLAZING)
F - FIXED
FR - FROSTED GLAZING
GB - GLASS BRICK
H - HINGED DOOR
S - SLIDING
SD - SLIDING DOOR
STKSD - STACKING TYPE SLIDING DOOR

FLOOR FINISHES LEGEND:

C - CARPET
CT - CERAMIC TILES
L - LINOLEUM
NC - NATURAL CONCRETE

SCALE 1:100 — 1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 10-10-2016

REFERENCE	
SITE PLAN	NHO-K-001
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CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

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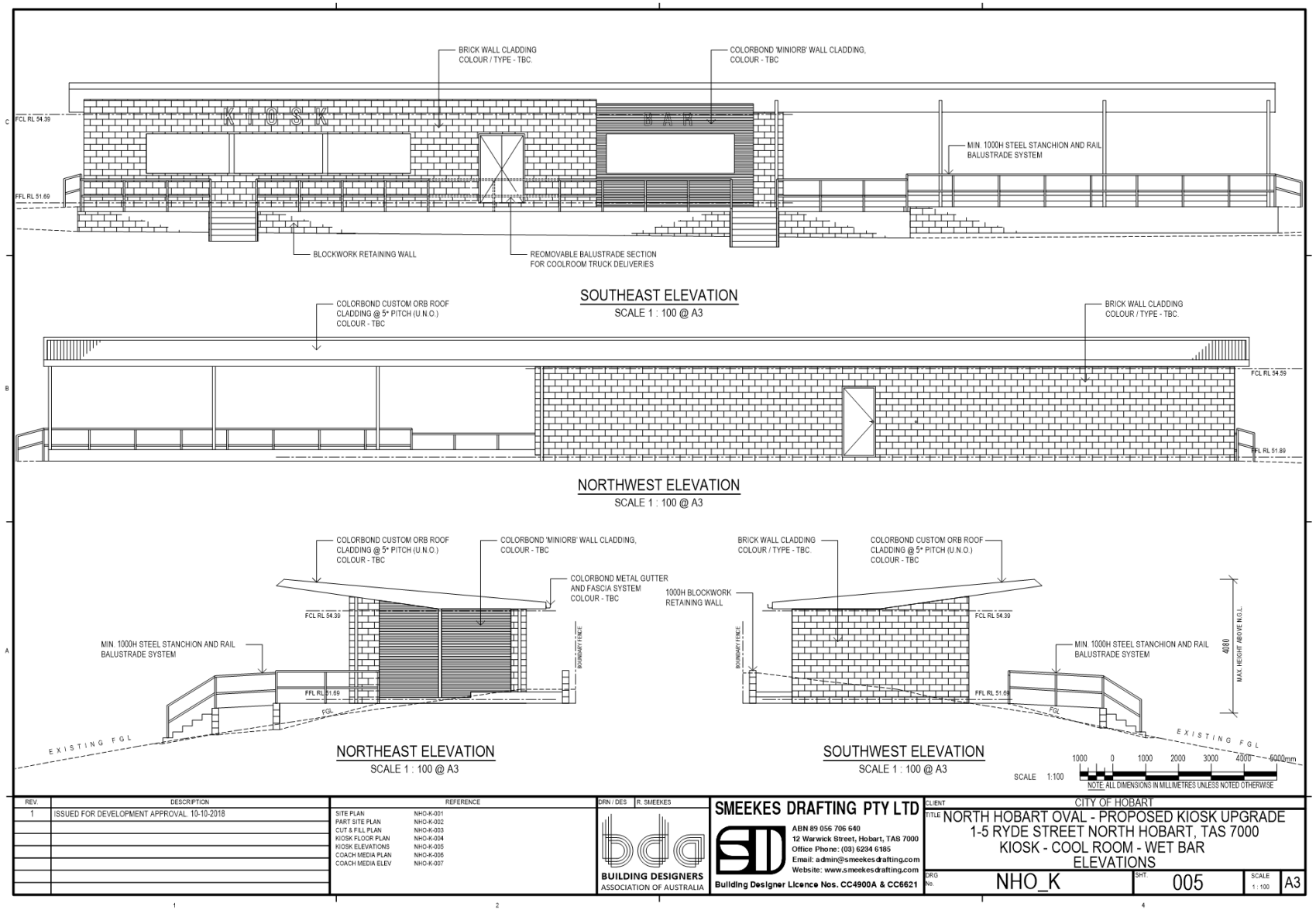
CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
FLOOR PLAN

ORG No.: NHO_K | SHT.: 004 | SCALE: 1 : 100 | A3


BRICK WALL CLADDING
COLOUR / TYPE - TBC.
COLORBOND 'MINIORB' WALL CLADDING,
COLOUR - TBC
K I O S K
B A R
FCL RL 54.39
FFL RL 51.69
MIN. 1000H STEEL STANCHION AND RAIL
BALUSTRADE SYSTEM
BLOCKWORK RETAINING WALL
REMOVABLE BALUSTRADE SECTION
FOR COOLROOM TRUCK DELIVERIES
SOUTHEAST ELEVATION
SCALE 1 : 100 @ A3
COLORBOND CUSTOM ORB ROOF
CLADDING @ 5° PITCH (U.N.O.)
COLOUR - TBC
BRICK WALL CLADDING
COLOUR / TYPE - TBC.
FCL RL 54.39
FFL RL 51.89
NORTHWEST ELEVATION
SCALE 1 : 100 @ A3
COLORBOND CUSTOM ORB ROOF
CLADDING @ 5° PITCH (U.N.O.)
COLOUR - TBC
COLORBOND 'MINIORB' WALL CLADDING,
COLOUR - TBC
COLORBOND METAL GUTTER
AND FASCIA SYSTEM
COLOUR - TBC
FCL RL 54.39
MIN. 1000H STEEL STANCHION AND RAIL
BALUSTRADE SYSTEM
BOUNDARY FENCE
FFL RL 51.69
FGL
EXISTING FGL
NORTHEAST ELEVATION
SCALE 1 : 100 @ A3
BRICK WALL CLADDING
COLOUR / TYPE - TBC.
COLORBOND CUSTOM ORB ROOF
CLADDING @ 5° PITCH (U.N.O.)
COLOUR - TBC
1000H BLOCKWORK
RETAINING WALL
BOUNDARY FENCE
FCL RL 54.39
MIN. 1000H STEEL STANCHION AND RAIL
BALUSTRADE SYSTEM
4080
MAX. HEIGHT ABOVE N.G.L.
FFL RL 51.69
FGL
EXISTING FGL
SOUTHWEST ELEVATION
SCALE 1 : 100 @ A3
SCALE 1:100
1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE
REV. 1
DESCRIPTION: ISSUED FOR DEVELOPMENT APPROVAL 10-10-2018
REFERENCE
SITE PLAN NHO-K-001
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CUT & FILL PLAN NHO-K-003
KIOSK FLOOR PLAN NHO-K-004
KIOSK ELEVATIONS NHO-K-005
COACH MEDIA PLAN NHO-K-006
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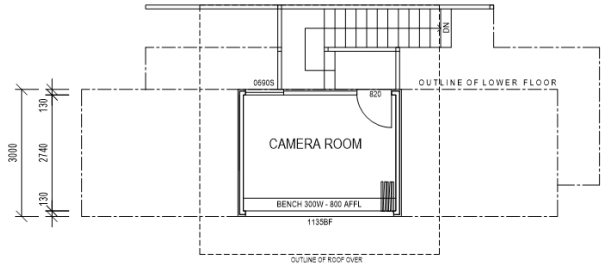
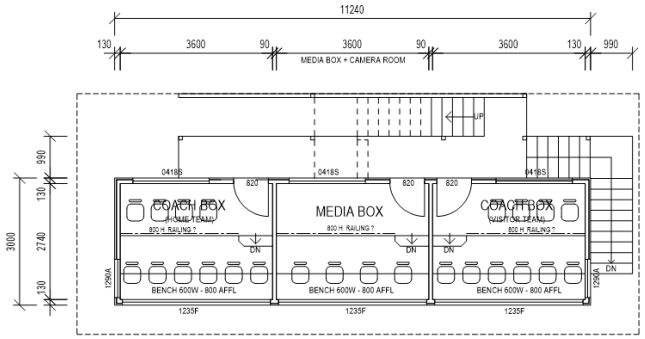
CLIENT CITY OF HOBART
TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
ELEVATIONS
ORG No. NHO_K
SHT. 005
SCALE 1 : 100
A3



LEVEL 2 (CAMERA ROOM) FLOOR PLAN
SCALE 1 : 100 @ A3



LEVEL 1 (COACHES + MEDIA) FLOOR PLAN
SCALE 1 : 100 @ A3

FLOOR FINISHES LEGEND:

- C - CARPET
- CT - CERAMIC TILES
- L - LINOLEUM
- NC - NATURAL CONCRETE

WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

- A - AWNING
- BF - BIFOLD DOOR
- C - CUSTOM (BUTTED CORNER GLAZING)
- F - FIXED
- FR - FROSTED GLAZING
- GB - GLASS BRICK
- H - HINGED DOOR
- S - SLIDING
- SD - SLIDING DOOR
- STKSD - STACKING TYPE SLIDING DOOR

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
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   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

SCALE 1:100 — 1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

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KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES R. SMEEKES

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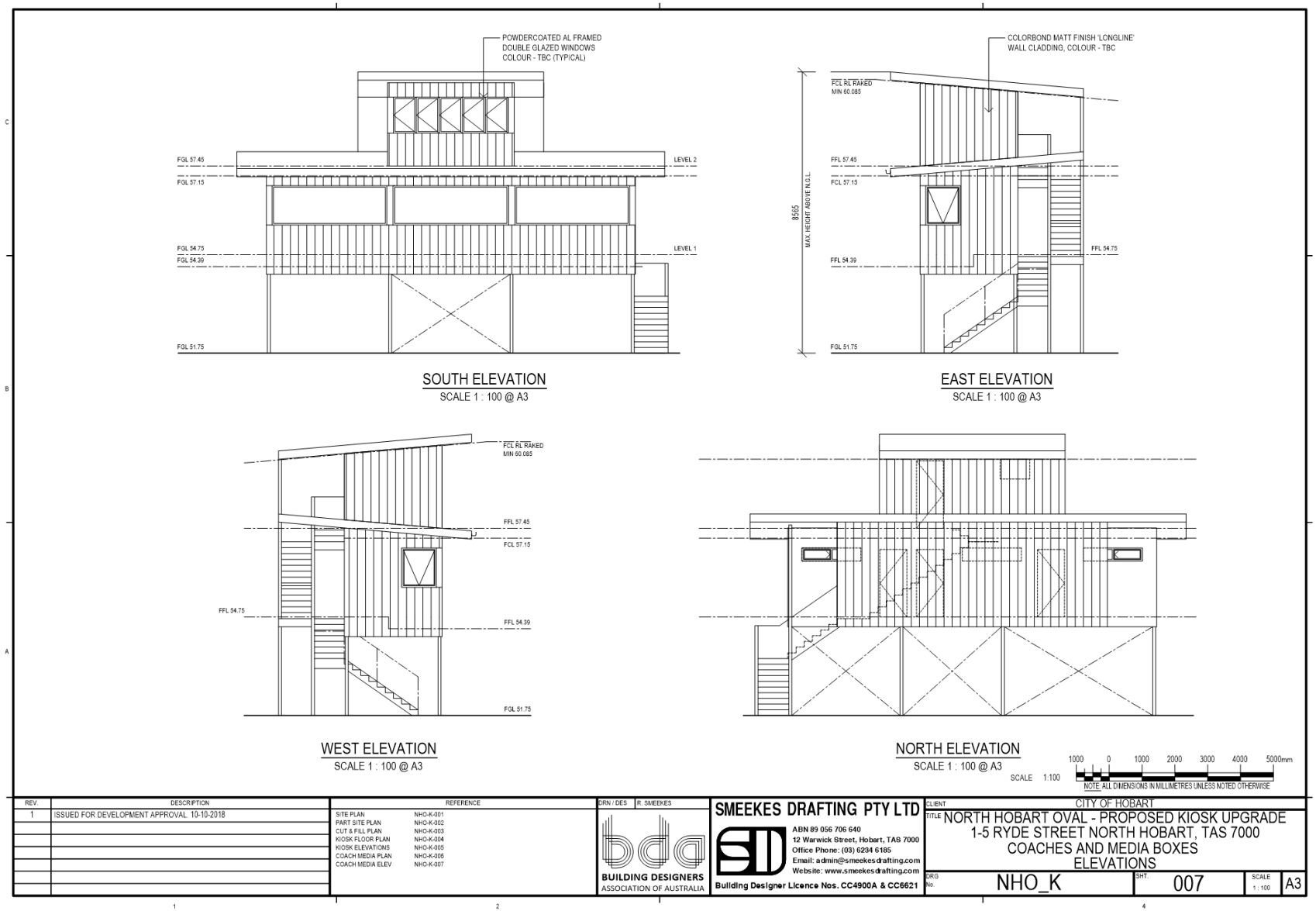
CLIENT CITY OF HOBART

TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
FLOOR PLANS

ORG No. NHO_K | SHT. 006 | SCALE 1 : 100 | A3



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1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
ELEVATIONS

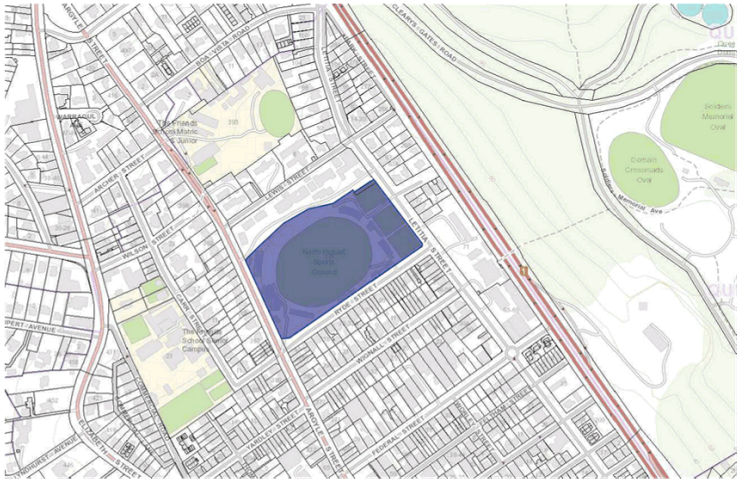
ORG No.: NHO_K | SHT.: 007 | SCALE: 1 : 100 | A3

PROPOSED DEVELOPMENT
1-5 RYDE STREET,
NORTH HOBART, 7000
TASMANIA

NOT FOR CONSTRUCTION

INDEX

C00	INDEX & COVER SHEET
N01	CIVIL & HYDRAULIC NOTES
N02	SYMBOLS & LINE LEGENDS
C01	EXISTING SITE PLAN SH.1
C02	EXISTING SITE PLAN SH.2
C02A	DEMOLITION PLAN
C03	PROPOSED SITE PLAN SH.1
C04	PROPOSED SITE PLAN SH.2
C05	SOIL & WATER MANAGEMENT PLAN
H01	SEWER & WATER HYDRAULIC PLAN
H02	SEWER LONG SECTION SH.1
H03	SEWER LONG SECTION SH.2
H04	STORMWATER DRAINAGE PLAN



LOCALITY PLAN
SCALE: NTS

DESIGN SPECIFICATIONS

1. STORMWATER PIPE COVER DESIGNED TO TASMANIAN STANDARD DRAWINGS (LGAT).
2. SEWER PIPELINE DESIGNED TO MRWA SEWERAGE STANDARDS.

N

REV	DESCRIPTION	BY	CHK	DATE
A	FOR PLANNING APPROVAL	ET	MH	27/11/18

JSA CONSULTING ENGINEERS
Ellerslie House, Level 1, 119 Sandy Bay Road, Sandy Bay TAS 7005
Phone (03) 6224 5625 www.jsaengineers.com.au

CHECKED: M. HORSHAM CC5865 I	SCALE: AS SHOWN	SIZE: A3
CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER	
STATUS: PLANNING APPROVAL		

PROJECT: PROPOSED DEVELOPMENT 1-5 RYDE STREET, NORTH HOBART, 7000

DRAWING TITLE: INDEX & COVER SHEET

PROJECT NO	DWG NO	REV
18E02-36	C00	A

17/07/2018 2:16:33 PM

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CIVIL AND HYDRAULIC NOTES

GENERAL NOTES

1. THE MAIN CONTRACTOR AND ALL SUB CONTRACTORS SHALL COMPLY WITH THE STATE WORK HEALTH AND SAFETY ACT AND ALL RELEVANT CODES OF PRACTICE.
2. ALL HYDRAULICS WORKS TO BE CARRIED OUT IN ACCORDANCE WITH IPWEA STANDARD DRAWINGS AND SPECIFICATIONS, (WSAA SEWERAGE CODE OF AUSTRALIA & WATER SUPPLY CODE OF AUSTRALIA) AND TO THE SATISFACTION OF COUNCIL'S DEVELOPMENT ENGINEER.
3. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR CONTACTING TASNETWORKS TO APPLY FOR NEW CONNECTIONS AND/OR ADDITIONAL SUPPLY. SUFFICIENT TIME FOR TASNETWORKS DESIGN AND REVIEW PROCESSES SHOULD BE ALLOW FOR.
4. NO TOP SOIL SHALL BE REMOVED FROM THE SITE WITHOUT THE CONSENT OF COUNCIL. TOP SOIL DISTURBED OR REMOVED AS A RESULT OF WORKS SHALL BE STOCK-PILED ON SITE AND LATER USED FOR REDRESSING ANY DISTURBED SURFACES.
5. ALL DISTURBED SURFACES ON SITE, EXCEPT THOSE SET ASIDE FOR ROADWAYS AND FOOTPATHS SHALL BE DRESSED WITH IMPORTED FILL AND REVEGETATED TO THE SATISFACTION OF THE COUNCIL'S DEVELOPMENT ENGINEER.
6. ALL EXISTING SERVICES TO BE LOCATED ON SITE PRIOR TO THE COMMENCEMENT OF WORKS.
7. ALL LEVELS TO BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
8. ALL CONNECTIONS TO EXISTING STORMWATER MAINS TO BE CARRIED OUT BY COUNCIL AT DEVELOPERS COST UNLESS APPROVED OTHERWISE, ALL CONNECTIONS TO SEWER/WATER MAINS TO BE CARRIED OUT BY TASWATER AT DEVELOPERS COST UNLESS APPROVED OTHERWISE
9. GENERAL MATERIALS, INSTALLATION AND TESTING SHALL COMPLY WITH TASMANIAN MUNICIPAL STANDARDS PART 4.
10. EXCAVATED AND IMPORTED MATERIAL USED AS FILL TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.
11. ANY DEPARTURES FROM THE DESIGN DRAWINGS ARE TO BE AT THE WRITTEN APPROVAL OF THE ENGINEER AND APPROVAL FROM THE AUTHORITY. CHANGES INCLUDES CONFLICTS WITH EXISTING SERVICES.
12. UNLESS NOTED OTHERWISE, THESE NOTES SHALL APPLY TO ALL DRAWINGS IN THE SET
13. BATTERS:

MAX EMBANKMENT SLOPE	1:3.0
MAX CUTTING SLOPE	1:2.0 (LOOSE ROCK)
	1:3.0 (SOIL)

APPROVALS:

1. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT A VALID BUILDING AND PLUMBING PERMIT IS IN PLACE FOR THE WORK AND THAT THE BUILDING SURVEYOR IS NOTIFIED OF ALL SITE INSPECTION REQUESTS.
2. THE APPLICANT SHALL NOT COMMENCE CIVIL CONSTRUCTION WORKS WITHIN A ROAD RESERVE UNTIL THE FOLLOWING REQUIREMENTS ARE MET:
3. A 'PERMIT TO CARRY OUT WORKS WITHIN A COUNCIL ROAD RESERVATION' HAS BEEN ISSUED BY THE COUNCIL AND THE ASSOCIATED FEE PAYMENT MADE
4. TRAFFIC MANAGEMENT AND PEDESTRIAN PLAN HAS BEEN PRODUCED AND FOLLOWED IN ACCORDANCE WITH DEPARTMENT OF INFRASTRUCTURE, ENERGY AND RESOURCES 'TRAFFIC CONTROL AT WORK SITES' CODE OF PRACTICE.

GENERAL HYDRAULICS NOTES:

1. DURING CONSTRUCTION ANY OPEN PIPES TO BE SEALED TEMPORARILY DURING WORKS TO PREVENT ENTRY OF FOREIGN MATTER
2. CONCEAL ALL PIPEWORK IN DUCTS, CEILING SPACES, WALL CAVITIES UNLESS OTHERWISE NOTED
3. CONFIRM ALL INVERT LEVELS PRIOR TO EXCAVATION.
4. THE LOCATION OF EXISTING SERVICES SHOULD BE CONFIRMED ONSITE INCLUDING: MAINS WATER, GAS, TELECOMMUNICATIONS, POWER, SEWER STORMWATER.
5. ALL PIPEWORK UNDER TRAFFICABLE AREAS TO BE BACKFILLED TO FULL DEPTH WITH DIER CLASS A 19MM FCR COMPACTED TO AS3798.
6. FOR CLASS H AND E SITES, JOINTS IN PLUMBING SHALL BE ARTICULATED WITHIN 3M OF THE BUILDING UNDER CONSTRUCTION TO ACCOMMODATE GROUND MOVEMENT WITHOUT LEAKAGE.
7. ALL PIPEWORK SHALL BE ADEQUATELY SUPPORTED. SUPPORT SHALL ALLOW FOR EXPANSION AND BE FITTED AT THE TIME OF PIPE INSTALLATION
8. WHERE PIPEWORK PENETRATES FIRE RATED WALL OR FLOORS A FIRE STOP COLLAR SHALL BE INSTALLED

SEWER NOTES:

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH WSAA SEWERAGE CODE OF AUSTRALIA WSA 02-2014-3.1 MRWA EDITION V2.0, TASWATERS SUPPLEMENT TO THIS CODE, AS3500.2:2003 AND TO THE SATISFACTION OF TASWATER'S DEVELOPMENT ENGINEER.
2. ALL EXISTING SERVICES TO BE LOCATED ON SITE PRIOR TO THE COMMENCEMENT OF WORKS.
3. ALL CONNECTIONS TO EXISTING MAINS TO BE CARRIED OUT BY TASWATER'S APPROVED CONTRACTOR AT DEVELOPERS COST UNLESS APPROVED OTHERWISE.
4. GENERAL MATERIALS, INSTALLATION & TESTING SHALL COMPLY WITH WSAA SEWERAGE CODE OF AUSTRALIA WSA 02-2014-3.1 MRWA EDITION V2.0, TASWATERS SUPPLEMENT TO THIS CODE, AS3500.2:2003 AND TO THE SATISFACTION OF TASWATER'S DEVELOPMENT ENGINEER.
5. ALL DROPS MUST BE INTERNAL AND IN ACCORDANCE WITH MRWA S-311.
6. ALL PIPE WORK UNDER TRAFFICABLE AREAS, INCLUDING DRIVEWAYS, IS TO BE BACKFILLED WITH FCR.
7. LOT CONNECTIONS SHALL BE DN100 UPVC U.N.O. AS PER MRWA S-302 AND BRING INSPECTION OPENING TO SURFACE INSIDE LOT BOUNDARY.
8. ALL SEWER MAINS TO BE PIPE CLASS SN8.
9. PIPEWORK SHALL BE PRESSURE TESTED PROGRESSIVELY DURING INSTALLATION TO ENSURE ABSENCE OF LEAKS.
10. ALL PIPEWORK SHALL BE INSTALLED AS CLOSE AS PRACTICABLE TO THE UNDERSIDE OF FLOORS.

STORMWATER NOTES:

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL MUNICIPAL STANDARDS, AS3500 AND IPWEA (TAS) MUNICIPAL STANDARD DRAWINGS AND SPECIFICATIONS WHERE APPLICABLE AND TO THE SATISFACTION OF COUNCIL'S MUNICIPAL ENGINEER
2. ALL EXISTING SERVICES TO BE LOCATED ON SITE PRIOR TO THE COMMENCEMENT OF WORKS. ALL CONNECTIONS TO EXISTING MAINS TO BE CARRIED OUT BY COUNCIL AT DEVELOPERS COST UNLESS APPROVED OTHERWISE.
3. GENERAL MATERIALS, INSTALLATION & TESTING SHALL COMPLY WITH TASMANIAN MUNICIPAL STANDARDS PART 4. PROVIDE 600mm MIN COVER TO ALL SERVICES.
4. ALL PIPE WORK UNDER TRAFFICABLE AREAS INCLUDING DRIVEWAYS IS TO BE FILLED WITH FCR.
5. LOT CONNECTIONS SHALL BE DN150 UPVC UNO MINIMUM PIPE CLASS TO BE CLASS SN4, PIPE UNDER ROADS TO BE CLASS SN8.
6. ALL MAINTENANCE HOLES DEEPER THAN 1m FROM FINISHED SURFACE LEVEL TO MAINTENANCE HOLE BASE TO BE FITTED WITH APPROVED STEP IRONS.
7. IPWEA STANDARD DRAWINGS REFERENCED ARE THE MOST RECENT DRAWING SET UNO.

WATER NOTES:

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH WSAA WATER SUPPLY CODE OF AUSTRALIA WSA 03-2011-3.1 MRWA EDITION V2.0, TASWATERS SUPPLEMENT TO THIS CODE AND TO THE SATISFACTION OF TASWATERS DEVELOPMENT ENGINEER.
2. ALL EXISTING SERVICES TO BE LOCATED ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
3. ALL CONNECTIONS TO EXISTING MAINS TO BE CARRIED OUT BY TASWATER AT DEVELOPERS COST UNLESS APPROVED OTHERWISE.
4. GENERAL MATERIALS INSTALLATION AND TESTING SHALL COMPLY WITH WSA 03-2011-3.1 AND TASWATER APPROVED PRODUCTS CATALOGUE.
5. WATER MAIN TO BE oPVC SERIES 2 CLASS 16 OR APPROVED EQUIVALENT, WITH RODS AND CONNECTIONS BEING POLY PN16 PE100.
6. THRUST BLOCKS SHALL BE INSTALLED AT ALL TEES, BLANK ENDS, VALVES, FIRE HYDRANTS, REDUCERS AND BENDS GREATER THAN 5°.
7. INDIVIDUAL LOT CONNECTIONS TO BE MIN DN25 ID20 PN16 POLY UNO.
8. DEVELOPER TO MAKE APPLICATION TO TASWATER FOR THE SUPPLY OF 20mm WATER METER AND BOX, PRIOR TO COMMENCEMENT OF WORKS ONSITE. METER TO BE INSTALLED BY PLUMBING CONTRACTOR.
9. ALL ISOLATION VALVES SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS. VALVES LOCATED IN WALLS OR DUCTS SHALL BE FITTED WITH APPROVED ACCESS COVERS.
10. INTERNAL PLUMBING SHALL BE CONSTRUCTED IN ACCORDANCE WITH AS3500 PARTS 1, 2 & 3 AND THE TASMANIAN PLUMBING CODE.
11. THE PLUMBER SHALL ARRANGE FOR ALL INSPECTIONS AND PRESSURE TESTING REQUIRED BY TASWATER OR THE LOCAL AUTHORITY PRIOR TO CONCEALMENT.
12. ALL STOP VALVES TO BE CLOCKWISE CLOSING.
13. PROVIDE C.I. VALVE BOX COVERS TO ALL VALVES AND FIRE PLUG.
14. STOP VALVES AND FIRE PLUGS SHALL BE MARKED IN ACCORDANCE WITH THE IPWEA FIRE HYDRANT GUIDELINES: TASMANIA DIVISION.
15. FIRE PLUGS AND VALVE POSITIONS TO BE MARKED ON KERB BACKS WITH HIMARK CONCRETE PAINT.
16. PROVIDE ELECTROMAGNETIC, METAL IMPREGNATED TAPE IN ALL NON METALLIC PIPE TRENCHES. ENSURE TAPE TERMINATIONS ARE ACCESSIBLE.
17. ALL PROPERTY CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MRWA-W-110 AND MRWA-W-111 AND TASWATER STANDARD DRAWING TW-SD-W-20 SERIES. THEY SHALL BE DN25 (ID20) HDPE PE100 SDR11 PN16 PIPE
18. ALL FITTINGS TO BE F.B.E.
19. FIRE PLUGS TO HAVE 100mm RISERS WITH SPRING TYPE PLUGS.
20. TASWATER TO WITNESS PRESSURE TEST TO 1200kPA PRIOR TO BACKFILL AT JOINTS.
21. MAIN TO BE DISINFECTED PRIOR TO CONNECTION TO THE RETICULATION NETWORK. REFER TO WSA CODE FOR DETAILS.
22. PLACEMENT OF WATER MAINS IN FILL REQUIRES THE CONTRACTOR TO PROVIDE DOCUMENTARY EVIDENCE INCLUDING; THE COMPOSITION OF FILL MATERIAL, VERIFYING THAT IT CONTAINS NO ORGANIC OR OTHER MATERIALS THAT DECOMPOSE OR OTHERWISE LEAD TO LONG TERM SETTLEMENT.

ROAD NOTES:

1. MINIMUM SUB BASE THICKNESS TO BE 200mm.
2. PRIOR TO PLACEMENT OF SUB BASE COURSE, PAVEMENT CUT IS TO BE ROLLED AND TESTED FOR CBR VALUES BY METHOD APPROVED BY THE SUPERINTENDENT. WHERE THE CBR VALUES ARE LESS THAN 5 WITHIN THE FIRST 200mm THEN ADDITIONAL TESTS WILL BE REQUIRED TO ALLOW SUFFICIENT DESIGN ALTERATIONS TO THE SUB BASE.
3. PAVEMENT DESIGN BASED ON A CBR VALUE OF 3-4%.
4. ROAD MARKINGS AND SIGNS AS PER AS1742
5. IF THE CBR VALUE IS LESS THAN 5 AT ANY DEPTH GREATER THAN 200mm THEN THE SUB BASE IS TO BE INCREASED GENERALLY ACCORDING TO THE FOLLOWING TABLE & CONSULT ENGINEER:

CBR VALUES:	DESIGN:
5-12	AS PER PAVEMENT DETAIL
~4	ADVISE & CONSULT ENGINEER. TYPICALLY INCREASE SUB BASE TO 400mm THICK (SUBGRADE REPLACEMENT)
<4	ADVISE & CONSULT ENGINEER. SPECIAL PAVEMENT DESIGN TO BE SPECIFIED.

DRIVEWAY NOTES:

1. EXCAVATED AND IMPORTED MATERIAL USED AS FILL IS TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.
2. FILL MATERIAL SHALL BE WELL GRADED AND FREE OF BOULDERS OR COBBLES EXCEEDING 150mm IN DIAMETER UNLESS APPROVED OTHERWISE.
3. FILL REQUIRED TO SUPPORT DRIVEWAYS INCLUDING FILL IN EMBANKMENTS THAT SUPPORT DRIVEWAYS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
4. TOP SOIL AND ORGANIC MATTER SHALL BE STRIPPED TO A MINIMUM OF 100mm.
5. THE SUB GRADE SHALL BE CHECKED FOR A MINIMUM BEARING CAPACITY OF 50 kPa.
6. FILL IN EMBANKMENTS SHALL BE KEYED 150mm INTO NATURAL GROUND.
7. THE FILL SHALL BE COMPACTED IN HORIZONTAL LAYERS OF NOT MORE THAN 200mm.
8. EACH LAYER SHALL BE COMPACTED TO A MINIMUM DENSITY RATIO OF 95%, IT IS THE BUILDERS RESPONSIBILITY TO ENSURE THAT THIS IS ACHIEVED.
9. WHERE THE ABOVE REQUIREMENTS CANNOT BE ACHIEVED THE ENGINEER SHALL BE CONSULTED AND THE FORMATION SHALL BE PROOF ROLLED (UNDER SUPERVISION OF THE ENGINEER) TO DEMONSTRATE COMPACTION PRIOR TO THE PLACEMENT OF BASE OR SUB-BASE COURSES.
10. UNREINFORCED CONCRETE KERBS AND CHANNELS SHALL HAVE TROWELLED JOINTS AT NOT MORE THAN 3.0m CRS

CONTROLLED FILL:

1. CONTROLLED FILL SHALL BE LAID IN STRICT ACCORDANCE WITH AS2870 AND AS3798 REQUIREMENTS. THE FOLLOWING METHOD IS APPROVED:
2. FILL MATERIAL SHALL BE WELL GRADED FCR OR SITE ROCK REVIEWED DURING EXCAVATION.
3. THE SUB GRADE SHALL BE CHECKED FOR BEARING CAPACITY WHICH IS A MINIMUM OF 50kPa FOR SLABS AND A MINIMUM OF 100kPa FOR FOOTINGS.
4. THE FILL SHALL BE COMPACTED IN HORIZONTAL LAYERS OF NOT MORE THAN 150mm
5. THE FILL SHALL BE COMPACTED TO A MINIMUM DENSITY RATIO OF 95% FOR RESIDENTIAL APPLICATIONS. IT IS THE BUILDERS RESPONSIBILITY TO ENSURE THAT THIS LEVEL OF COMPACTION IS ACHIEVED. IMPORTED MATERIAL, CONTRARY TO THE ABOVE SPECIFICATION, INTENDED FOR USE AS STRUCTURAL FILL SHALL BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO USE.

CONCRETE:

1. CONCRETE SHALL BE NOT LESS THAN N25 GRADE, WITH 20mm NOMINAL MAXIMUM AGGREGATE SIZE, SLUMP SHALL BE SELECTED TO SUIT THE CONSTRUCTION CONDITIONS. UNLESS NOTED OTHERWISE THE MINIMUM APPROPRIATE SPECIFICATIONS FROM AS3600 AND AS2870 SHALL BE ADOPTED.
2. SAWN CONTROL JOINTS SHALL BE CONSTRUCTED AS SOON AS POSSIBLE WITHOUT RAVELING THE JOINT, GENERALLY THIS SHALL BE WITHIN 24 HOURS.
3. CONCRETE SHALL BE CURED FOR A MINIMUM OF 7 DAYS USING CURRENT BEST PRACTICE METHODS. SPRAY APPLIED CURING COMPOUNDS ARE GENERALLY NOT DEEMED SATISFACTORY AS SOLE CURING METHOD.
4. CONCRETE SHALL BE MECHANICALLY VIBRATED U.N.O.
5. ADDITIONAL WATER SHALL NOT BE ADDED TO THE CONCRETE ON SITE UNLESS SIGNED BY THE DRIVER AND APPROVED BY THE SUPPLIER.

DISCLAIMER
ENGINEERING NOTES ARE INTENDED FOR USE AS A GUIDE TO RELEVANT CODES, REGULATIONS AND STANDARDS FOR THE BUILDER OR CONTRACTOR DURING THE CONSTRUCTION PROCESS, THEY SHALL NOT REPLACE THEM IN ANY WAY. THESE NOTES ARE NOT SITE SPECIFIC AND SHALL NOT BE USED TO CONTRAVENE APPROVED PLANS OR TO SPECIFY ANY UNAPPROVED WORKS.

REV	DESCRIPTION	BY	CHK	DATE
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CHECKED: M. HORSHAM CC5865 I	SCALE: AS SHOWN	SIZE: A3	PROJECT: PROPOSED DEVELOPMENT 1-5 RYDE STREET, NORTH HOBART, 7000
CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
STATUS: PLANNING APPROVAL			

DRAWING TITLE	PROJECT NO	DWG NO	REV
CIVIL & HYDRAULIC NOTES	18E02-36	N01	A

20/07/2018 9:45:03 AM

NOT FOR CONSTRUCTION

PIPE LEGEND

MARK	DESCRIPTION
AG	SLOTTED HDPE SN8 DRAINAGE PIPE
W	PROPOSED PE PN16 WATER SUPPLY
S	PROPOSED SEWER PIPE
RSM	PROPOSED RISING SEWER MAIN
SW	PROPOSED STORMWATER PIPE
MW	PROPOSED MAIN WATER PIPE
P	POWER CIRCUIT
T	COMMUNICATIONS
PS	DN100 PVC-M PN16 PVC
EX AG	EXISTING SLOTTED AG DRAINAGE PIPE.
EX W	EXISTING WATER SUPPLY
EX S	EXISTING SEWER PIPE
EX RSM	EXISTING RISING SEWER MAIN
EX SW	EXISTING STORMWATER
EX MW	EXISTING MAIN WATER
EX P	EXISTING POWER
MW	DEMOLISHED MAIN WATER
SW	DEMOLISHED STORMWATER
S	DEMOLISHED SEWER
W	DEMOLISHED WATER
>	SWALE DRAIN

LINE LEGEND

MARK	DESCRIPTION
	PROPERTY BOUNDARY
	SURROUNDING PROPERTY BOUNDARY
	PROPOSED PROPERTY BOUNDARY
	EXISTING EASEMENT
	PROPOSED EASEMENT
	NATURAL SURFACE CONTOUR (MAJOR)
	NATURAL SURFACE CONTOUR (MINOR)
	BANK TOP
	BANK BOTTOM
	EXISTING BUILDING OUTLINE
	PROPOSED BUILDING OUTLINE
	PROPOSED ROAD CENTRELINE
	PROPOSED ROAD
	EXISTING ROAD
	EXISTING KERB
	PROPOSED BARRIER FENCE

SYMBOL LEGEND

MARK	DESCRIPTION
MM	DN50 ID 40 WATER CONNECTION + METER AS PER TW-SD-W-20 SERIES
M	DN25 ID 20 WATER CONNECTION + METER AS PER TW-SD-W-20 SERIES
	'ACO' 450 x 450 x 600 DEEP PIT WITH GRATED LID
	'ACO' K300 CHANNEL DRAIN & INCLINE PIT WITH CLASS 'B' TRAFFICABLE GRATE
SW	STORMWATER MANHOLE AS PER LGAT STANDARD DRAWING TSD-SW02-v1
S	SEWER MAINTENANCE HOLE TYPE P2 AS PER WSAA STANDARD DRAWING MRWA-S-300 SERIES
	DN150 STORMWATER LOT CONNECTION AS PER LGAT STANDARD DRAWINGS TSD-SW25-v1
H	DN100 SEWER LOT CONNECTION AS PER WSAA STANDARD DRAWING MRWA-S-300 SERIES
FH	FIRE HYDRANT AS PER MRWA-W-302
	ISOLATING VALVE AS PER MRWA-W-302
	THRUST BLOCK (CONCRETE) AS PER MRWA-W-205A
	CONCRETE HEADWALL
	SIDE ENTRY PIT TYPE 5 AS PER TSD-SW12-v1
	SIDE ENTRY PIT TYPE 3 AS PER TSD-SW09-v1
PS-1	POWER SUBSTATION
	POWER TURRET
PS	NBN PIT
	STREETLIGHT

HATCH LEGEND

MARK	DESCRIPTION
	CONCRETE DRIVEWAY WITH PR. CONTOUR SHOWN 120 THICK, SL82 CENTRAL FINISH EXPOSED AGGREGATE
	EXISTING CONCRETE SLABS ETC.
	CONCRETE FOOTPATH 100 THICK SL72 CENTRAL
	RETAINING WALL
	SUSPENDED/CANTILEVERED DRIVEWAY
	EASEMENT

SURFACE LEGEND

MARK	DESCRIPTION
FSL XX.XX	PROPOSED FINISHED SURFACE LEVEL
Δ XX.XX	HEIGHT OF PROPOSED SURFACE RELATIVE TO NATURAL SURFACE (FILL REQUIRED)
Δ -XX.XX	HEIGHT OF PROPOSED SURFACE RELATIVE TO NATURAL SURFACE (CUT REQUIRED)

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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
STATUS: PLANNING APPROVAL			

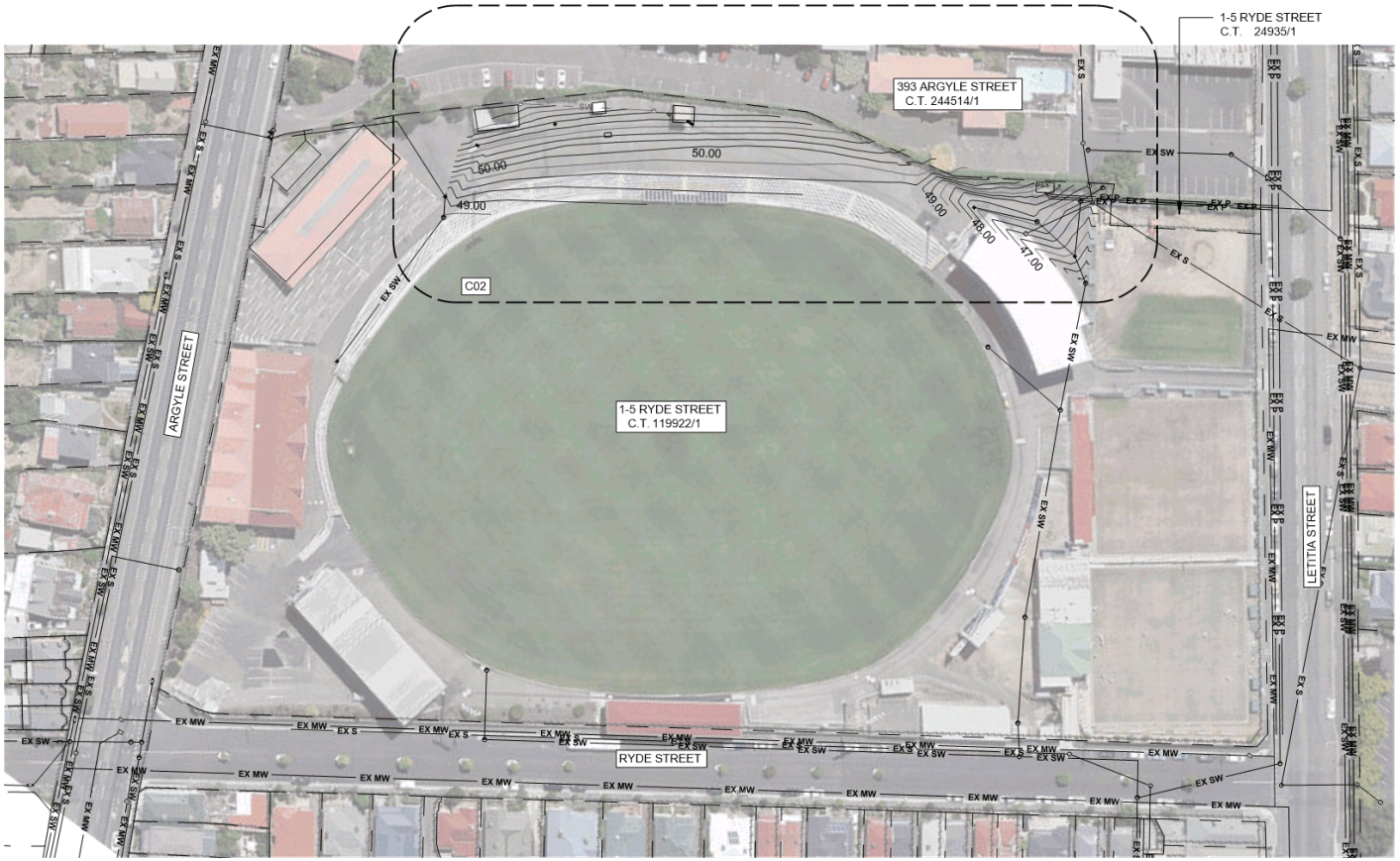
DRAWING TITLE	PROJECT NO	DWG NO	REV
SYMBOL & LINE LEGENDS	18E02-36	N02	A

20/07/2018 9:45:08 AM

NOTES:

1. SURVEY DATA COMPLETED AND PROVIDED BY 18269-01, DATED 20/07/18, REFERENCE NO. 18269-01,
2. HORIZONTAL DATUM MGA55, VERTICAL DATUM AHD PER SPM8956, CONTOUR INTERVALS AT 0.25m.
3. LOCATION AND INVERTS OF EXISTING SERVICES MEASURED BY ENGINEER ON SITE, DATED 06/11/18.

NOT FOR CONSTRUCTION



0 50 100 150m

SCALE 1:1000 AT A3 SHEET

EXISTING SITE PLAN SH.1
SCALE: 1:1000

REV	DESCRIPTION	BY	CHK	DATE
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STATUS: PLANNING APPROVAL		

PROJECT: PROPOSED DEVELOPMENT
1-5 RYDE STREET,
NORTH HOBART, 7000

DRAWING TITLE: EXISTING SITE PLAN SH.1

PROJECT NO	DWG NO	REV
18E02-36	C01	A

20/07/2018 9:45:13 AM

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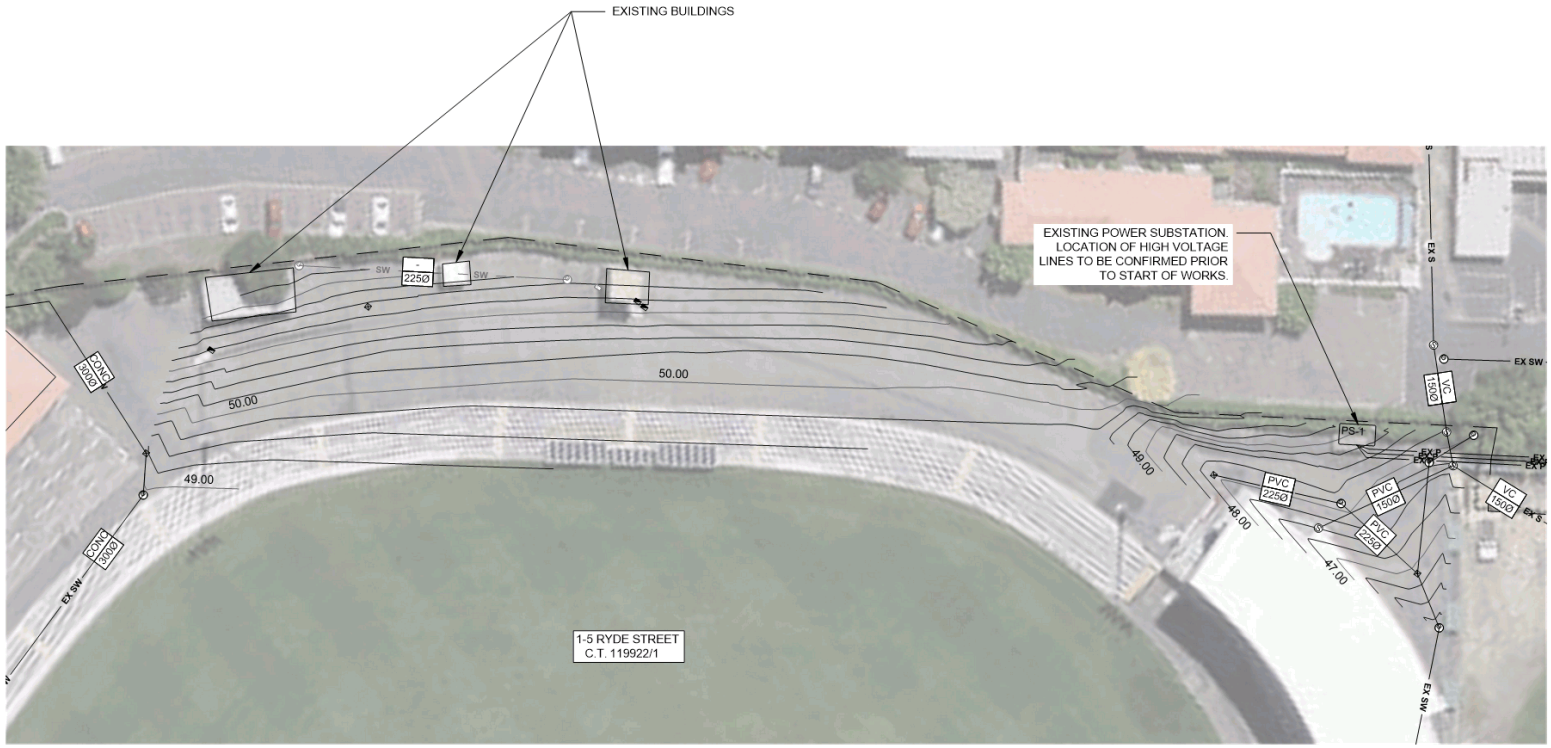

15 0 15 30 45m

SCALE 1:500 AT A3 SHEET

EXISTING SITE PLAN SH.2
SCALE: 1:500

REV	DESCRIPTION	BY	CHK	DATE
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DRAWING TITLE: EXISTING SITE PLAN SH.2

PROJECT NO	DWG NO	REV
18E02-36	C02	A

20/07/2018 9:45:13 AM

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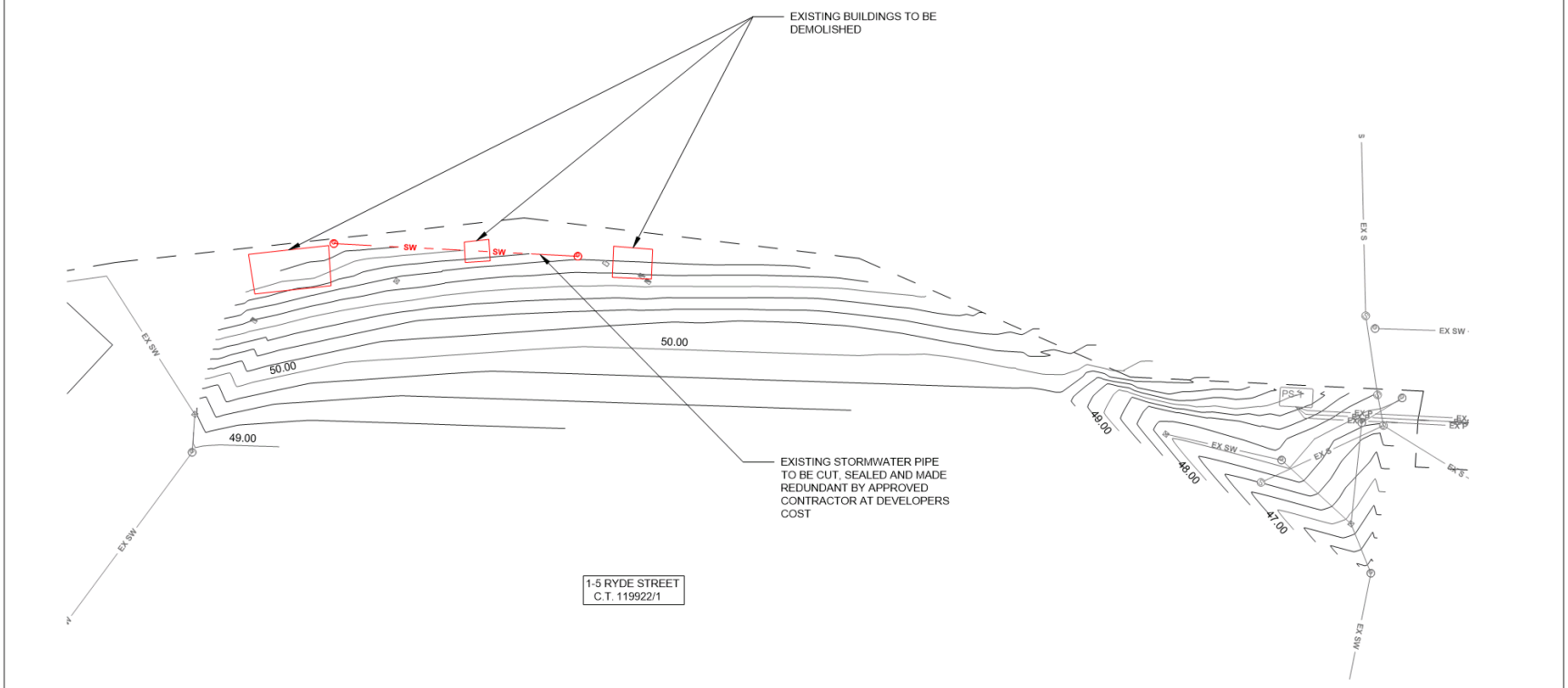

15 0 15 30 45m

SCALE 1:500 AT A3 SHEET

DEMOLITION PLAN
SCALE: 1:500

REV	DESCRIPTION	BY	CHK	DATE
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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
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DRAWING TITLE		
DEMOLITION PLAN		
PROJECT NO: 18E02-36	DWG NO: C02A	REV: A

20/07/2018 9:45:13 AM

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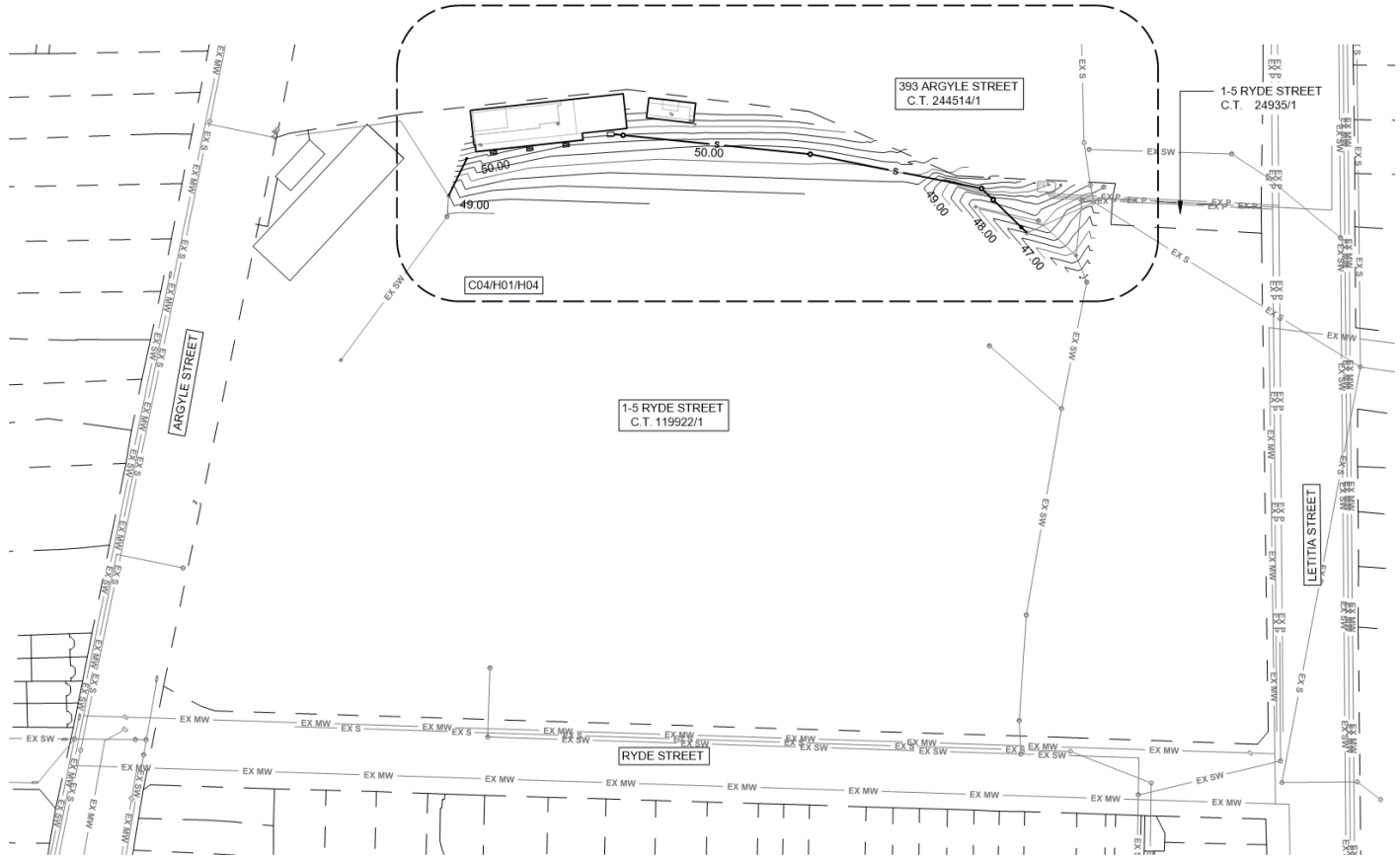

0 50 100 150m

SCALE 1:1000 AT A3 SHEET

PROPOSED SITE PLAN SH.1
SCALE: 1:1000

REV	DESCRIPTION	BY	CHK	DATE
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JSA CONSULTING ENGINEERS
Ellerslie House, Level 1, 119 Sandy Bay Road, Sandy Bay TAS 7005
Phone (03) 6224 5625 www.jsaengineers.com.au

CHECKED: M. HORSHAM CC5865 I	SCALE: AS SHOWN	SIZE: A3
CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER	
STATUS: PLANNING APPROVAL		

PROJECT: PROPOSED DEVELOPMENT
1-5 RYDE STREET,
NORTH HOBART, 7000

DRAWING TITLE: PROPOSED SITE PLAN SH.1

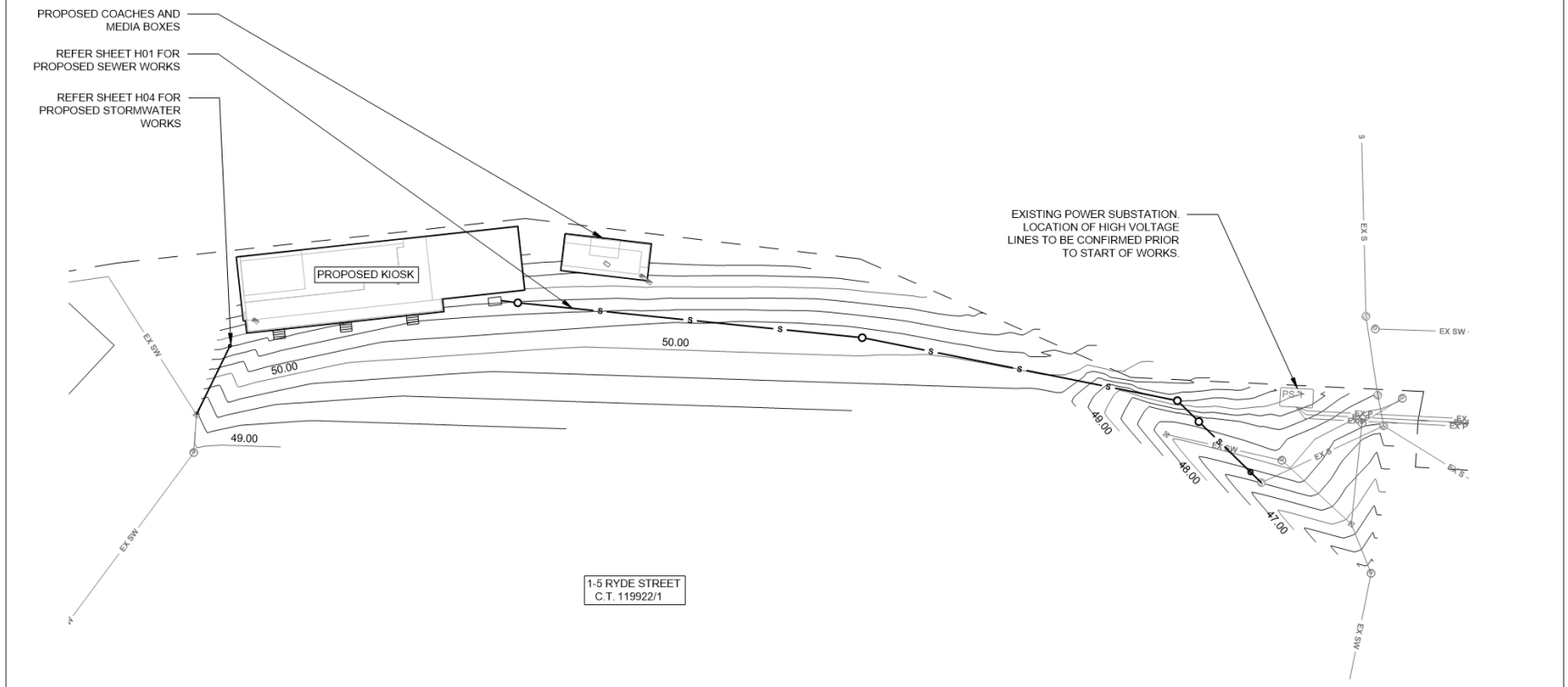
PROJECT NO	DWG NO	REV
18E02-36	C03	A

20/07/2018 9:45:13 AM

NOTES:

1. SURVEY DATA COMPLETED AND PROVIDED BY 18269-01, DATED 20/07/18, REFERENCE NO. 18269-01,
2. HORIZONTAL DATUM MGA55, VERTICAL DATUM AHD PER SPM8956, CONTOUR INTERVALS AT 0.25m.
3. LOCATION AND INVERTS OF EXISTING SERVICES MEASURED BY ENGINEER ON SITE, DATED 06/11/18.

NOT FOR CONSTRUCTION



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SCALE 1:500 AT A3 SHEET

PROPOSED SITE PLAN SH.2
SCALE: 1:500

REV	DESCRIPTION	BY	CHK	DATE
A	FOR PLANNING APPROVAL	ET	MH	27/11/18

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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
STATUS: PLANNING APPROVAL			

DRAWING TITLE: PROPOSED SITE PLAN SH.2

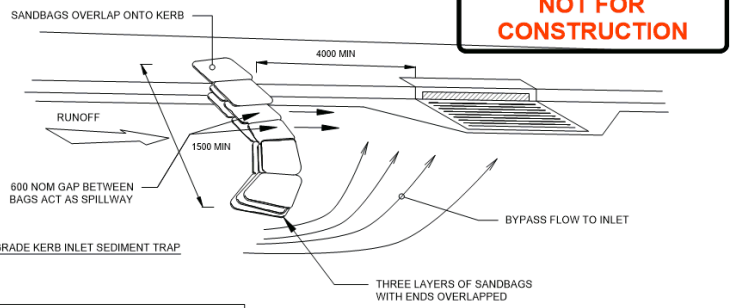
PROJECT NO	DWG NO	REV
18E02-36	C04	A

20/07/2018 9:45:13 AM

NOTES

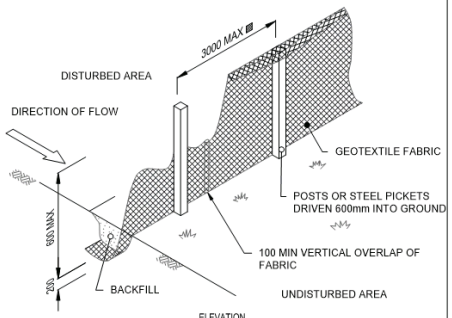
1. GENERAL
   a. TEMPORARY DRAINAGE CONTROL. FLOW SHOULD BE DIVERTED AROUND THE WORK SITE WHERE POSSIBLE.
   b. ALL DRAINAGE, EROSION AND SEDIMENT CONTROLS TO BE INSTALLED AND BE OPERATIONAL BEFORE COMMENCING UP-SLOPE EARTHWORKS.
   c. ALL CONTROL MEASURES TO BE INSPECTED AT LEAST WEEKLY AND AFTER SIGNIFICANT RUNOFF PRODUCING STORMS.
   d. CONTROL MEASURES MAY BE REMOVED WHEN ON-SITE EROSION IS CONTROLLED AND 70% PERMANENT SOIL COVERAGE IS OBTAINED OVER ALL UPSTREAM DISTURBED LAND.
   e. IN AREAS WHERE RUNOFF TURBIDITY IS TO BE CONTROLLED, EXPOSED SURFACES TO BE EITHER MULCHED, COVERED WITH EROSION CONTROL BLANKETS OR TURFED IF EARTHWORKS ARE EXPECTED TO BE DELAYED FOR MORE THAN 14 DAYS.
   f. STRAW BALE SEDIMENT TRAPS ARE A SECONDARY OPTION WHICH GENERALLY SHOULD NOT BE USED IF OTHER OPTIONS ARE AVAILABLE.
2. SEDIMENT FENCE.
   a. NOT TO BE LOCATED IN AREAS OF CONCENTRATED FLOW.
   b. NORMALLY LOCATED ALONG THE CONTOUR WITH A MAXIMUM CATCHMENT AREA 0.6HA PER 100M LENGTH OF FENCE.
   c. WOVEN FABRICS ARE PREFERRED, NON-WOVEN FABRICS MAY BE USED ON SMALL WORK SITES, I.E. OPERATIONAL PERIOD LESS THAN 6 MONTHS OR ON SITE WHERE SIGNIFICANT SEDIMENT RUNOFF IS NOT EXPECTED.
   d. FENCES ARE REQUIRED 2M MIN FROM TOE OF CUT OR FILL BATTERS, WHERE NOT PRACTICAL ON FENCE CAN BE AT THE TOE WITH A SECOND FENCE 1M MIN AWAY. FENCE SHOULD NOT BE LOCATED PARALLEL WITH TOE IF CONCENTRATION OF FLOW WILL OCCUR BEHIND THE FENCE.
3. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL, MAINTAIN AND (UPON COMPLETION) REMOVE ALL SEDIMENT CONTROL MEASURES.
4. PROVIDE TEMPORARY CONNECTION FROM DOWNPIPES TO STORMWATER DRAIN IMMEDIATELY FOLLOWING COMPLETION OF ROOF CLADDING, FASCIA AND GUTTER INSTALLATION. PERMANENT DOWNPIPE CONNECTION TO BE INSTALLED AT APPROPRIATE TIME OF EXTENSION CONSTRUCTION.
5. ALL DIMENSIONS IN MILLIMETRES UNLESS INDICATED OTHERWISE.
6. SWMP TO BE ESTABLISHED AND INSPECTED BY A COUNCIL OFFICER PRIOR TO COMMENCEMENT OF WORKS ON SITE.
7. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH NRM SOUTH SOIL AND WATER MANAGEMENT OF CONSTRUCTION SITES - GUIDELINES AND TASMANIAN STANDARD DRAWINGS (TSD-SW28).

NOT FOR CONSTRUCTION

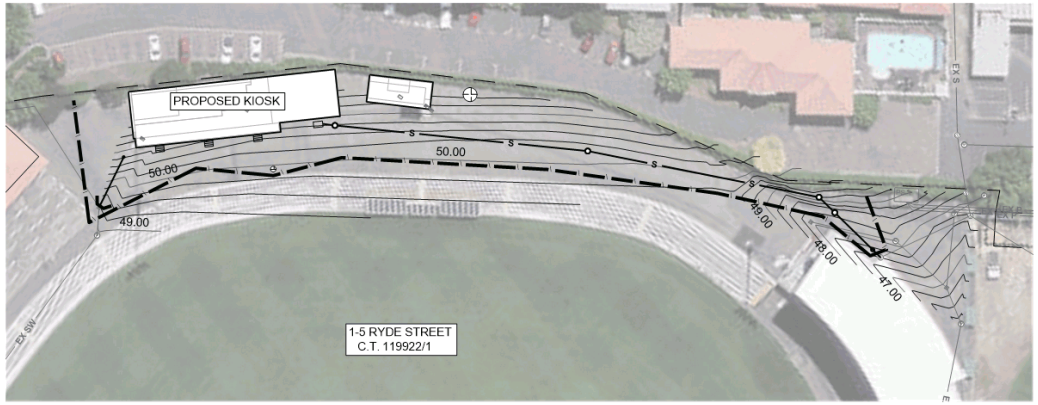


ON GRADE KERB INLET SEDIMENT TRAP

SYMBOL LEGEND	
MARK	DESCRIPTION
	SEDIMENT TRAP
	SEDIMENT FENCE
	APPROXIMATE LOCATION OF WASTE MATERIAL STOCKPILE
	APPROXIMATE LOCATION OF BUILDING MATERIAL STOCKPILE



ELEVATION



ANCHORING DETAIL

15 0 15 30 45 60m

SCALE 1:750 AT A3 SHEET

SOIL & WATER MANAGEMENT PLAN
SCALE: 1:750

REV	DESCRIPTION	BY	CHK	DATE
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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
STATUS: PLANNING APPROVAL			

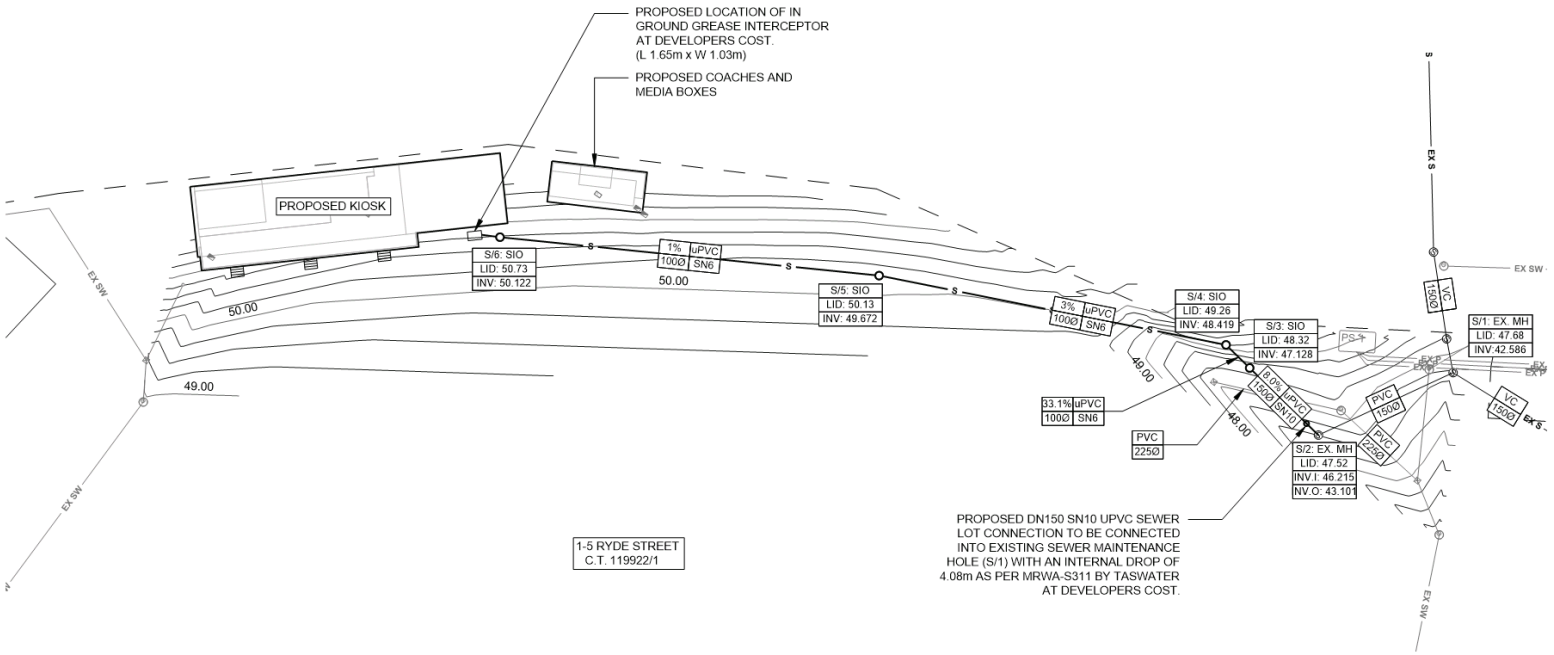
DRAWING TITLE		
SOIL & WATER MANAGEMENT PLAN		
PROJECT NO: 18E02-36	DWG NO: C05	REV: A

20/07/2018 9:45:13 AM

NOTES:

1. SURVEY DATA COMPLETED AND PROVIDED BY 18269-01, DATED 20/07/18, REFERENCE NO. 18269-01,
2. HORIZONTAL DATUM MGA55, VERTICAL DATUM AHD PER SPM8956, CONTOUR INTERVALS AT 0.25m.
3. LOCATION AND INVERTS OF EXISTING SERVICES MEASURED BY ENGINEER ON SITE, DATED 06/11/18.
4. REFER SHEET H02 & SHEET H03 FOR SEWER LONG SECTION AND INVERTS OF PROPOSED SEWER INSPECTION OPENING.
5. ALL LIVE WORKS TO BE COMPLETED BY TASWATER AT DEVELOPERS COST.

NOT FOR CONSTRUCTION



15 0 15 30 45m

SCALE 1:500 AT A3 SHEET

SEWER & WATER HYDRAULIC PLAN

SCALE: 1:500

REV	DESCRIPTION	BY	CHK	DATE
A	FOR PLANNING APPROVAL	ET	MH	27/11/18

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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
STATUS: PLANNING APPROVAL			

DRAWING TITLE		
SEWER & WATER HYDRAULIC PLAN		
PROJECT NO: 18E02-36	DWG NO: H01	REV: A

20/07/2018 9:45:13 AM

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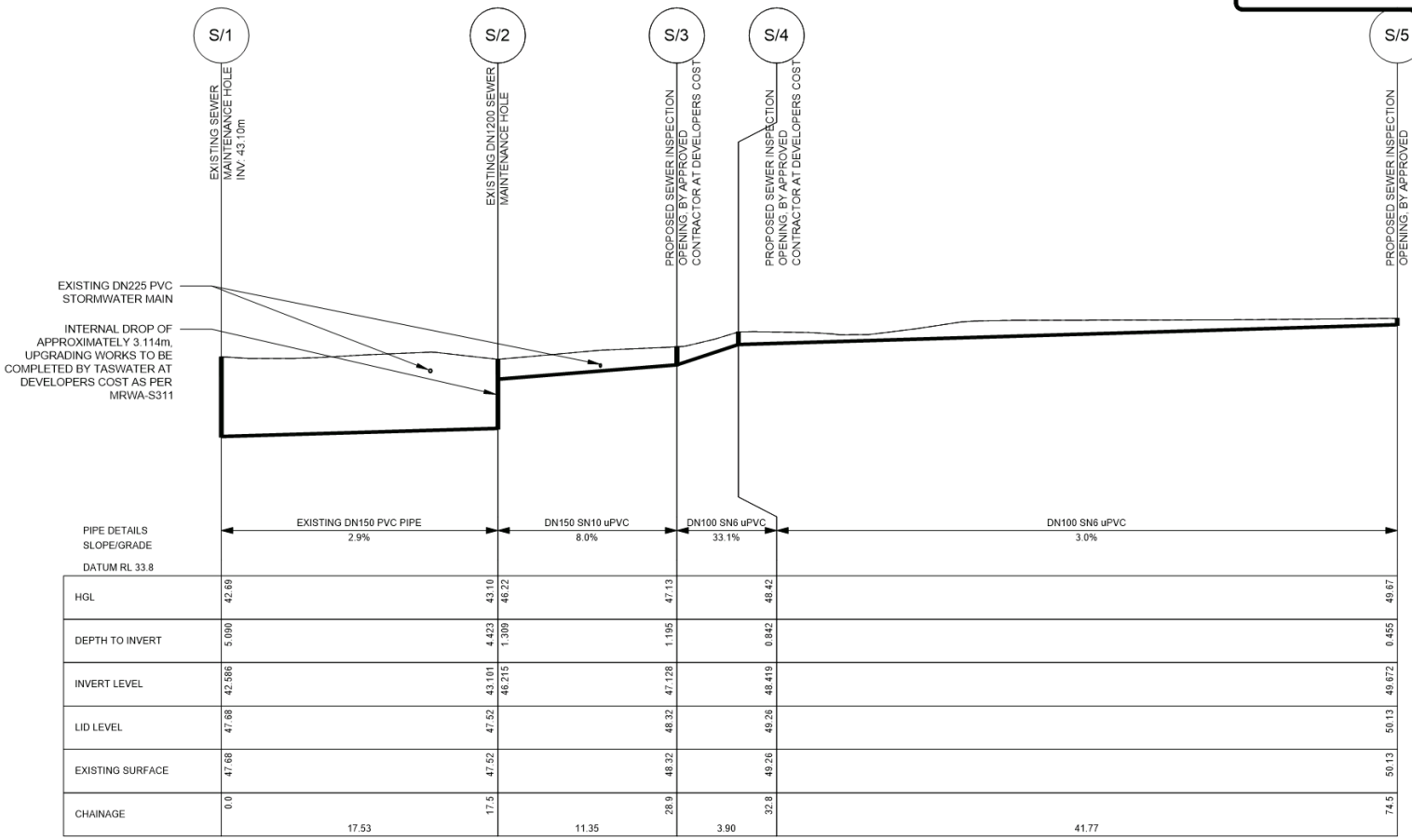

PIPE DETAILS	EXISTING DN150 PVC PIPE		DN150 SN10 uPVC		DN100 SN6 uPVC	DN100 SN6 uPVC	
SLOPE/GRADE	2.9%		8.0%		33.1%	3.0%	
DATUM RL 33.8							
HGL	42.69	43.10	46.22	47.13	48.42	49.67	
DEPTH TO INVERT	5.090	4.423	1.309	1.195	0.842	0.455	
INVERT LEVEL	42.586	43.101	46.215	47.128	48.419	49.672	
LID LEVEL	47.68	47.52		48.32	49.26	50.13	
EXISTING SURFACE	47.68	47.52		48.32	49.26	50.13	
CHAINAGE	0.0	17.5	28.9		32.8	74.5	
	17.53		11.35		3.90	41.77	

SEWER LONG SECTION SH.1
SCALE: H 1:500 V 1:500

REV	DESCRIPTION	BY	CHK	DATE
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SIZE: A3
CIVIL ENGINEER: E. TONG
HYDRAULIC ENGINEER: R. HORNER
STATUS: PLANNING APPROVAL

PROJECT: PROPOSED DEVELOPMENT
1-5 RYDE STREET,
NORTH HOBART, 7000

DRAWING TITLE: SEWER LONG SECTION SH.1
PROJECT NO: 18E02-36
DWG NO: H02
REV: A

20/07/2018 9:45:21 AM

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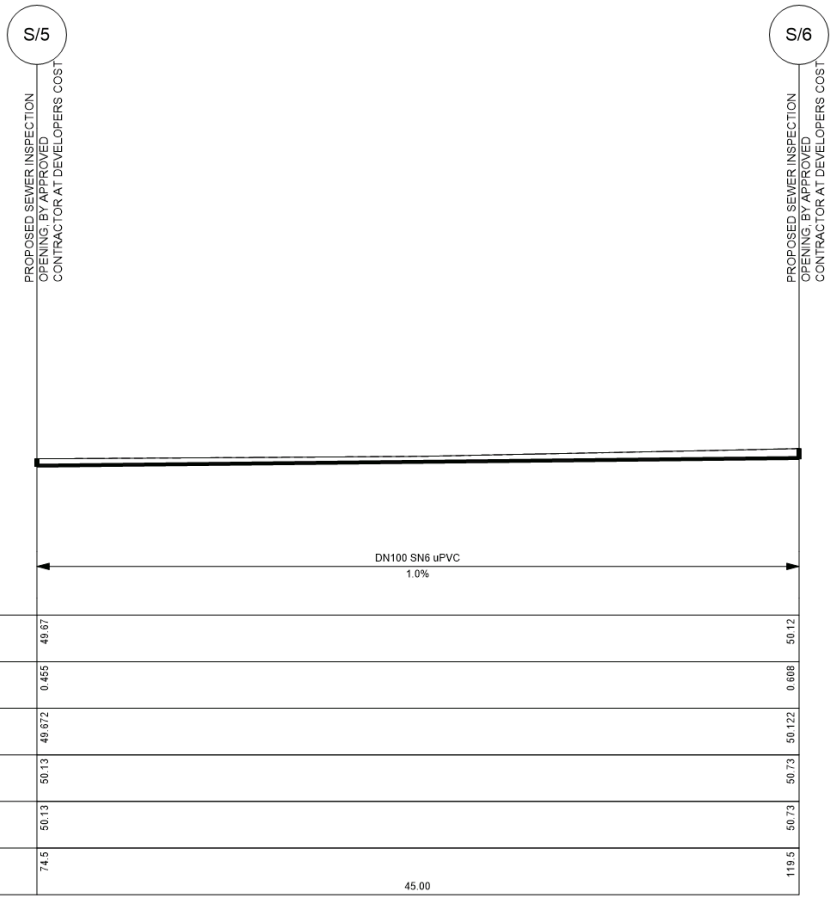

SEWER LONG SECTION SH.2
SCALE: H 1:500 V 1:500

REV	DESCRIPTION	BY	CHK	DATE
A	FOR PLANNING APPROVAL	ET	MH	27/11/18

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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER		
STATUS: PLANNING APPROVAL			

DRAWING TITLE		
SEWER LONG SECTION SH.2		
PROJECT NO	DWG NO	REV
18E02-36	H03	A

20/07/2018 9:45:21 AM

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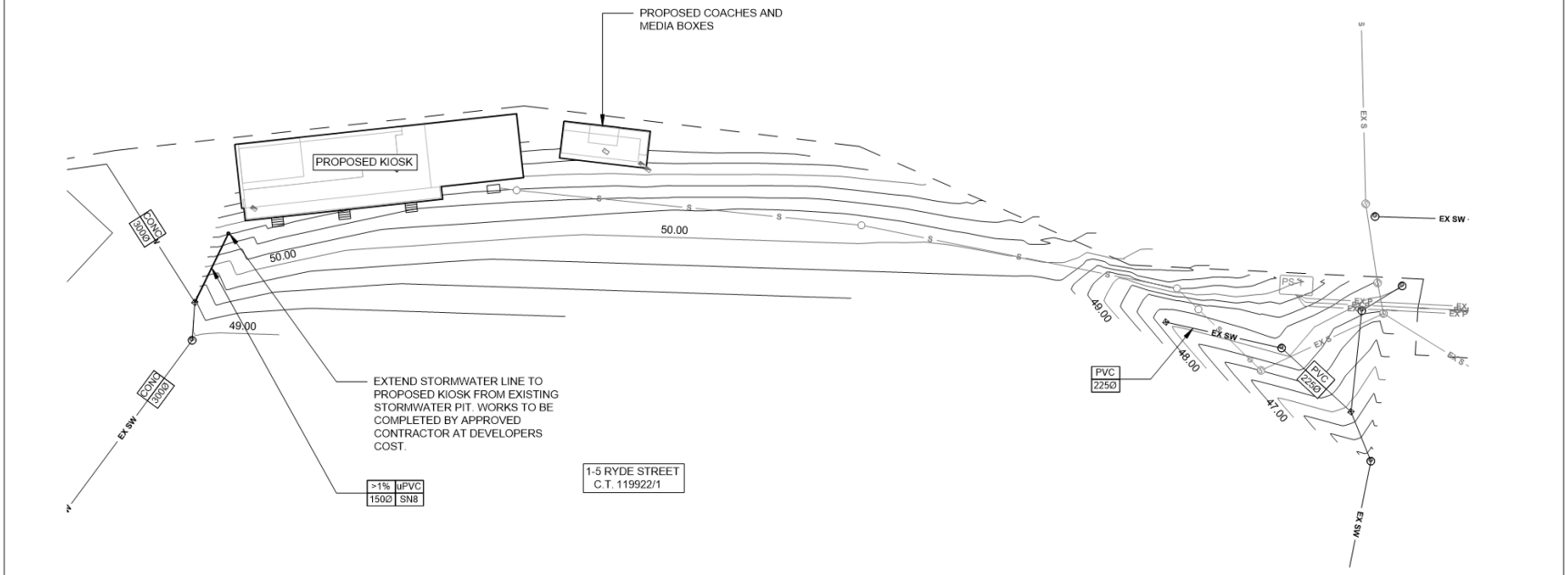

15 0 15 30 45m

SCALE 1:500 AT A3 SHEET

STORMWATER DRAINAGE PLAN
SCALE: 1:500

REV	DESCRIPTION	BY	CHK	DATE
A	FOR PLANNING APPROVAL	ET	MH	27/11/18

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CIVIL ENGINEER: E. TONG	HYDRAULIC ENGINEER: R. HORNER	
STATUS: PLANNING APPROVAL		

PROJECT: PROPOSED DEVELOPMENT
1-5 RYDE STREET,
NORTH HOBART, 7000

DRAWING TITLE: STORMWATER DRAINAGE PLAN

PROJECT NO	DWG NO	REV
18E02-36	H04	A

20/07/2018 9:45:13 AM

JSA CONSULTING ENGINEERS

Ben Ikin
Senior Statutory Planner
City Of Hobart
16 Elizabeth Street
Hobart TAS 7000

28 November 2018
Your reference: PLN-18-738
JSA reference: 18E02-36

Dear Ben,

RE: 1-5 RYDE STREET, NORTH HOBART – NORTH HOBART OVAL

APPLICATION NO. PLN-18-738

JSA Consulting Engineers have prepared a response to the request for information from Council dated 6th of November 2018 regarding the proposed new Kiosk and Media Box at North Hobart Oval.

The following points have been addressed:

Sw 1 *A concept servicing plan to demonstrate how stormwater from the proposed development will be disposed of via gravity to public stormwater infrastructure with sufficient receiving capacity or to a Council approved system. Clearly distinguish between existing and proposed, and private vs public.*

Response:

Drawings C01 through H04 in the attached drawing set show the new proposed stormwater solution being a DN150 PVC connection, connected to the existing stormwater infrastructure. There is no additional loading on the existing pit being connected to.

INFSw 1 *A scaled and dimensioned site plan demonstrating the following:*
1. The location of the DN225 public stormwater pipe on the property.
2. The location of the proposed development in relation to the stormwater pipe.
3. The location of the proposed footings from the development in relation to the stormwater pipe

Response:

Drawings C01 and C02 detail the existing DN225. We are unable to confirm the size as the pipe is 3/4's full with gravel and mud.

Drawing C04 shows the new development in relation to the existing pipe and Manholes.

As it is proposed to make the existing stormwater infrastructure redundant in this location there is no need for footing relationship or zone of influence documentation.

INFSw 2 *If the developer intends to remove or realign the current stormwater pipe, please provide CCTV with associated site stormwater plan demonstrating the following:*
1. CCTV footage and supporting documents showing the condition, any connections and location of downstream connection to public infrastructure.
2. A site plan showing size, location and depth including all incoming connection of the stormwater main.

Response:

Please see the attached report on the current stormwater pipe condition and connections.

The existing pipe and manholes should be made redundant as part of these works. The current condition and debris in the pipe make further investigation of this assent unachievable.

PCL1 *A construction and environmental management plan to ensure the excavated soil and associated contaminants do not spread to areas where ecological screening levels are applicable in accordance with the recommendations by EM&C in the Preliminary Environmental Site Assessment (PSEA) Report 1 5 Ryde Street, North Hobart, Tasmania dated 26 August 2018.*

Response:

Drawing C05 in the attached set outlines a detailed soil and water management plan for works to site.

Please contact Michael Stanojevic on 6224 5625 or michael@jsa.com.au if you require any further information.

Yours sincerely,

Michael Stanojevic

Senior Engineering Technician

JSA CONSULTING ENGINEERS

ENGINEERS CORRESPONDENCE

18	R	02	-	36	-	1	Existing Stormwater Redundancy - 21/11/2018

Project:	1-5 Ryde Street, North Hobart (Hydraulic Services)
To:	Paul Curtain

cc

Client:	Paul Curtain	
Building Surveyor:		
Builder:		
Designer:		

Site investigations on existing stormwater services completed to proposed development area.

All inlet pipes to Manhole 1 are redundant except for one connected to the existing kiosk and are DN100 earthenware.

The supposed DN225 between Manhole 1 and 2 can not be CCTV inspected due to debris in the pipe. The pipe is 3/4 full of mud and gravels. The exit pipe of Manhole 2 can not be CCTV inspected as this pipe is also full of gravel and mud.

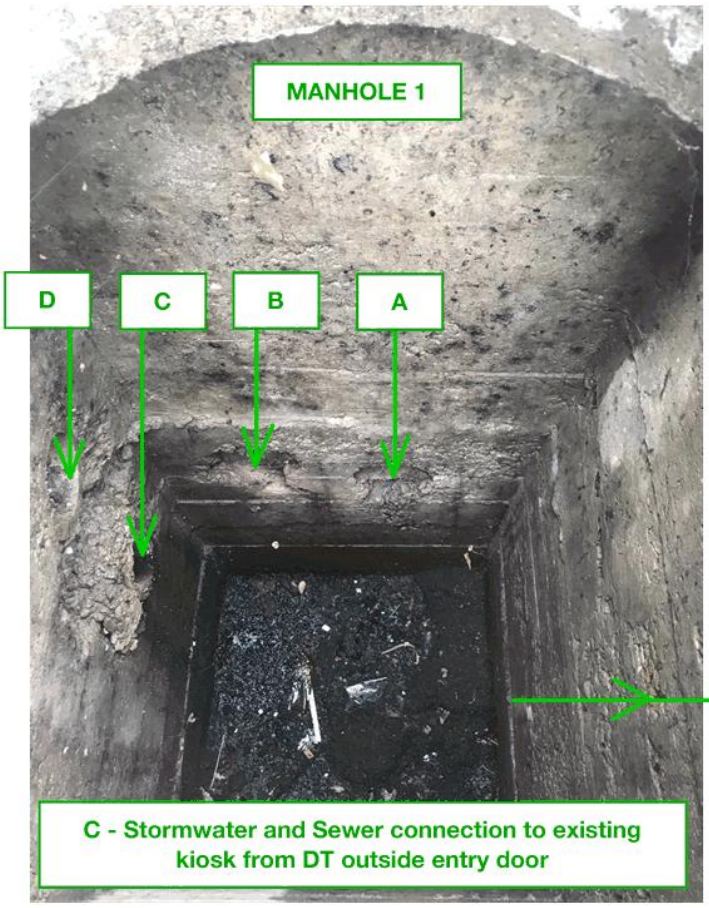
It is recommended that the development have new sewer and stormwater connections as proposed in the planning approval drawings and the exisiting stormwater inspected as part of this report be made redundant.

Engineer: Michael Stanojevic **Signed:** **Date:** 21/11/2018

Photos ☐Y ☐N Time: 5 Km: 9 (r2). Invoiced to: Client

JSA Consulting Engineers Pty Ltd
Ellerslie House, Level 1, 119 Sandy Bay Road, Sandy Bay 7005
Phone (03) 6224 5625 www.jsaengineers.com.au


ASSUMED PIPE LOCATION FROM SEP
SEP (Rydges)
MANHOLE 1
1630 Invert
MANHOLE 2
1510 Invert
NORTH HOBART OVAL STORMWATER INVESTIGATION PER HCC RFI - PLN-18-738
18E02-36
JSA CONSULTING
ENGINEERS



18E02-36

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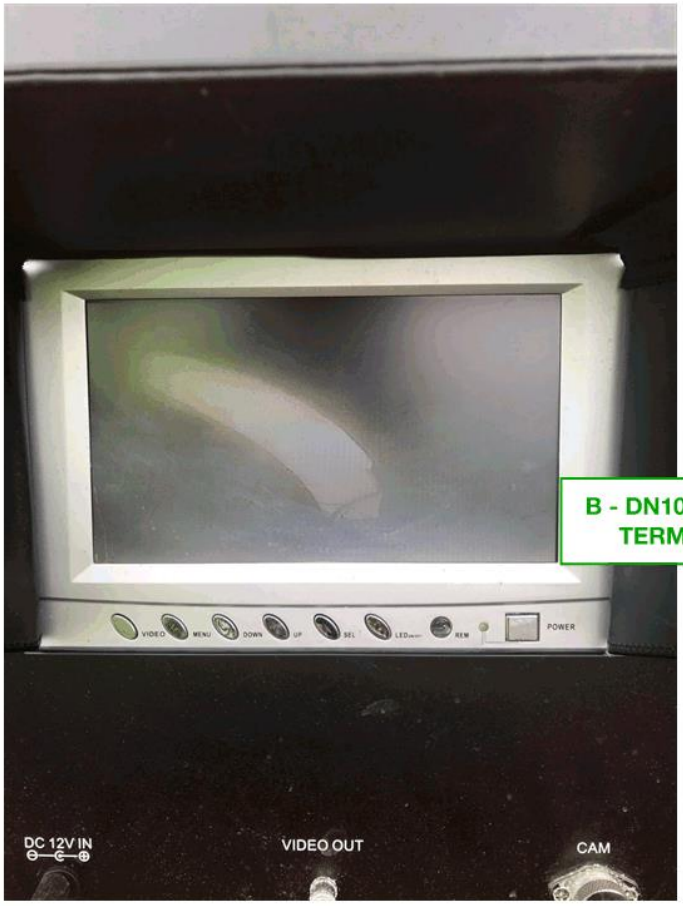

B - DN100 EARTHENWARE - TERMINATION AT 7.6M

D - DN100 EARTHENWARE - TERMINATION AT 0.2M

18E02-36

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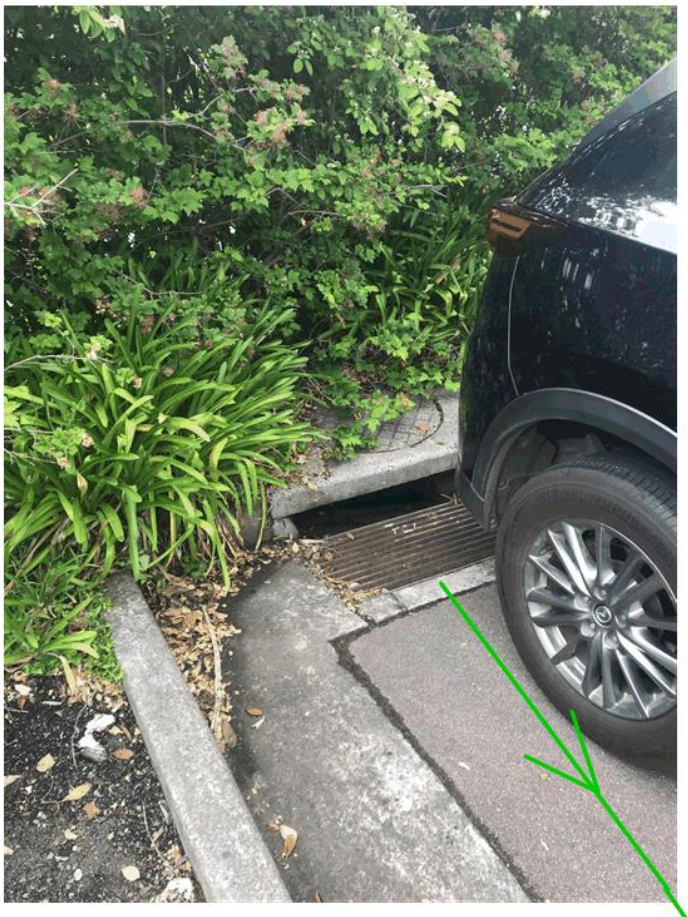

SIDE ENTRY PIT (Rydges) - DN 300
CONC HEADING AWAY FROM NHO

LEVEL 2 BIGGINS BLD. NORTH HOBART TAS p. 03 6231 5979 e. enquiry@enviromac.com.au w. enviromac.com.au

em&c
ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Document:

North Hobart Oval, Kiosk Upgrade

1-5 Ryde Street, North Hobart, Tasmania

Construction Environmental Management Plan (CEMP)

Prepared for:

North Hobart Football Club

Prepared by:

Environmental Management & Consulting Pty Ltd
ABN: 17 273 533 294
Office/ Mail: Level 2, 67 Letitia St, North Hobart 7000, Tasmania

Document Authored & Issued by:	**Simon Chislett** Principal Environmental Engineer, B.Eng (Env) Hons Environmental Management & Consulting Pty Ltd Certified Environmental Practitioner (CEnvP) Contaminated Site Specialist (EIANZ) Certification No: SC400112 Email: simon@enviromac.com.au

DOCUMENT REVISION RECORD

Rev	Date	Details of Revisions
R00	23 November 2018	Draft CEMP released for client comment
R01	27 November 2018	Final CEMP issued to client

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APPENDICIES

Appendix A	Preliminary Environmental Site Assessment, Environmental Management and Consulting. Issued 26 August 2018.
Appendix B	Smeeks Drafting Plans

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LIST OF COMMON REPORT ABBREVIATIONS

- ANZECC — Australian and New Zealand Environment and Conservation Council
- AST — Above-ground Storage Tank
- B(a)P — Benzo(a)Pyrene
- BTEX — Benzene, Toluene, Ethylbenzene and Xylenes
- CARE — Contamination Assessment and Remediation of the Environment
- COC — Chain Of Custody
- COPC — Contaminants Of Potential Concern
- CRC — Cooperative Research Centre
- DO — Dissolved Oxygen
- DQO — Data Quality Objective
- DNAPL — Dense Non-Aqueous Phase Liquid
- DSI — Detailed Site Investigation
- DTW — Depth to Water
- EC — Electrical Conductivity
- EIL — Ecological Investigation Level
- EM&C — Environmental Management & Consulting Pty Ltd
- ESA — Environmental Site Assessment
- ESL — Ecological Screening Level
- EPA — Environment Protection Authority
- HIL — Health Investigation Level
- HSL — Health Screening Level
- LNAPL — Light Non-Aqueous Phase Liquid
- LOR — Limit Of Reporting
- MAH — Monocyclic Aromatic Hydrocarbons
- mBGS — Metres Below Ground Surface
- mTOC — Metres below Top of Casing
- NEPM — National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013
- PAH — Polycyclic Aromatic Hydrocarbons
- Pb — Lead
- PH — Petroleum Hydrocarbon
- PID — Photo-Ionisation Detector
- PSI — Preliminary Site Investigation
- PVI — Petroleum Vapour Intrusion
- RPD — Relative Percentage Difference
- SAQP — Sample Analysis and Quality Plan
- TDS — Total Dissolved Solids
- TOC — Top Of Casing
- TPH/ TRH — Total Petroleum Hydrocarbons/ Total Recoverable Hydrocarbons
- UST — Underground Storage Tank
- VOC — Volatile Organic Compound
- QA/QC — Quality Assurance/ Quality Control

List of Abbreviated Measurement Units

m: metre	L: Litre	ppm: parts per million
km: kilometre	kL: kilolitre	ppb: parts per billion
mg/kg: milligram/ kilogram	mg/L: milligram/ litre	
µg/kg: microgram/ kilogram	µg/L: microgram/ litre	

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ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

1. INTRODUCTION

Environmental Management & Consulting Pty Ltd (EM&C) were engaged by North Hobart Football Club (NHFC) to prepare a Construction Environmental Management Plan (CEMP) for their proposed Kiosk Upgrade project, located at 1-5 Ryde Street, North Hobart, Tasmania (the 'site'). The location of the site within the suburb of North Hobart and state of Tasmania is shown on attached Figure 1.

This CEMP is to be read in conjunction with the Preliminary Environmental Assessment Report (The PSEA), prepared by EM&C for the NHFC [26 August 2018], Included as Appendix A.

1.1. OBJECTIVE

The objective of this CEMP is to provide NHFC's appointed Contractor with procedures to manage the environmental hazards and risks associated the with excavation and backfilling works to ensure the protection of human health and the environment. The scope of the works addressed by this CEMP is identified in the Section 1.2 below.

1.2. SCOPE OF CIVIL WORKS

This CEMP addresses the following proposed NHFC Kiosk Upgrade work elements:

- Excavation of approximately 189m2 to a depth of 51.49m RL - Assumed by EM&C to be equivalent with Australian Height Datum (AHD)
- Backfill of excavated material, over an area of 187m2 to a height of 51.49
- Offsite disposal of contaminated soil unsuitable for onsite reuse

These depths may change to some degree to make allowances for structural components, such as concrete slabs, floor joists etc.

A cut and fill diagram is contained within the design documentation, included within Appendix B, Specifically drawing: NHO_K 003.

This CEMP is limited to the above identified excavation and backfill scope of the kiosk building upgrade program and does not apply to any other potential work program at this site.

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2. ROLES AND RESPONSIBILITIES

Project roles and responsibilities for implementation of this CEMP are identified in the table below. Note that responsibilities may be combined where parties take on multiple roles.

Table 2.1 Roles and Responsibilities

Role	Identified Responsibilities

Principal Contractor	Overarching responsibility for ensuring legal compliance with implementation and completion of construction works. Responsible for:
	• Communicating with project stakeholders, including:
	  ○ Site Owner.
	  ○ EPA Tasmania.
	  ○ Local Council.
	  ○ Adjacent Property Owners.
	  ○ Utility Owners.
	• Investigation of environmental incidents (with Civil Works Contractor)
	• Oversight of the appointed Civil Contractor – to insure implementation and compliance with the CEMP.
	• Appointment of the Environmental Consultant

Civil Works Contractor	Implementing the requirements outlined in this CEMP, including:
	• Compliance with regulatory, legal and other identified CEMP requirements pertaining to the redevelopment works.
	• Inspecting and maintaining plant and equipment in accordance with industry standards, guidelines and regulations.
	• Management of all soil removed during excavation or imported to site, including:
	  ○ Controls to mitigate the generation of dust,
	  ○ Sediment run-off;
	  ○ Unwanted odour;
	  ○ Decontamination of mobile plant and equipment to avoid off-site spread of soil;
	  ○ Reuse of excavated soil onsite; and
	  ○ Removal, transport and off-site disposal of soil removed from the site in accordance with Tasmanian Waste Management Regulations.
	• Management or the disposal of any wastewater generated during the project in accordance with Tasmanian Waste Regulations and in accordance with the requirements of Council (for discharge to storm water) or TasWater (for discharge to Sewer).
	• CEMP compliance reporting to the Principal Contractor.
	• Immediately reporting any unexpected contamination finds to the Environmental Consultant. This may include, but is not limited to:
	  ○ Odourous soil, smelling like hydrocarbons (oils, petrol diesel etc.), methane, degraded organic matter (similar to swamps) or other identifiable chemicals
	  ○ Obviously stained soil, usually identified by non-natural colours
	  ○ Identified contaminants buried within the soil indicating previous hard waste disposal (batteries, tyres, drums etc.)
	  ○ Identification or possible identification of asbestos or asbestos containing materials (ACM)

Environmental Consultant	Provide advice and technical support to the appointed Civil Contractor, including: • Responding to notification of unexpected contamination finds. • Perform additional soil assessment of ex situ soil stockpiles to determine suitability for offsite disposal if required. Provide advice and technical support to the Principal Contractor, including: • Provision of advice to the Principal Contractor on compliance with the CEMP where necessary or when required. • Provision of all Environmental Assessment reports to the Principal Contractor

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3. LEGAL AND REGULATORY REQUIREMENTS

The following environmental, legal, statutory and guideline documents need to be adhered to for all works undertaken as part of the works program. Note:

- Other requirements will apply, and these should be addressed by the Principal Contractor through their own Construction Management Plan
- Some of the documents listed below may only be partially or potentially relevant to the proposed work scope

Table 3.1 Legal and Regulatory Requirements

Jurisdiction	Reference	Description
National	Acts and Regulations	Environment Protection and Biodiversity Conservation Act 1999 Environment Protection and Biodiversity Conservation Regulations 2000
	Model Codes of Practise	Excavation Work (March 2015) How to Manage and Control Asbestos in the Workplace (Dec 2011) Managing the Work Environment and Facilities (Dec 2011)
	National Standards	National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013. National Environment Protection (Ambient Air Quality) Measure, 1998. Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC: 1003 (1995)] Amendments to Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Apr 1998) Amendments to Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Apr 1997) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004)] Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (1999)] 2nd Edition (Apr 1999) Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)] National Model Regulation for the Control of Scheduled Carcinogenic Substances [NOHSC:1011 (1995)] National Standard for Occupational Noise [NOHSC: 1007(2000)] Workplace Exposure Standards for Airborne Contaminants (Apr 2013) Australian Standard AS 2436-2010 'Guide to noise control on construction, maintenance and demolition sites' AS/NZS 1269.1:2005 'Occupational noise management'
	Guides to Australian Standards	No Identified Relevant Requirements

Tasmania	Acts and Regulations	Environmental Management and Pollution Control Act 1994 Environmental Management and Pollution Control (Controlled Waste Tracking) Regulations 2010 No. 12 Environmental Management and Pollution Control (Distributed Atmospheric Emissions) Regulations 2007 No. 67 Environmental Management and Pollution Control (Distributed Atmospheric Emissions) Amendment Regulations 2010 No. 80 Environmental Management and Pollution Control (Miscellaneous Noise) Regulations 2004 No. 50 Environmental Management and Pollution Control (Waste Management) Regulations 2010 No. 104 EPA Tasmania Information Bulletin 105 'Classification and Management of Contaminated Soil For Disposal', Nov 2012. Tasmanian Environmental Protection Policy (Air Quality), 2004. Tasmanian State Policy on Water Quality Management, 1997.
	Codes of Practice	Construction Work (Dec 2012) Demolition Work (Dec 2012) Excavation Work (Dec 2012) How to Manage and Control Asbestos in the Workplace (Dec 2012) How to Safely Remove Asbestos (Dec 2012) Managing Noise and Preventing Hearing Loss at Work (Dec 2012) Managing Risks of Hazardous Chemicals in the Workplace (Dec 2012) Managing the Work Environment and Facilities (Dec 2012)
	Draft Model Codes of Practice	No Identified Relevant Requirements

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4. ENVIRONMENTAL MANAGEMENT PLANS

A number of environmental management plans, which include numerous controls and procedures, are presented within this section to provide guidance to the appointed Civil Works Contractor during the completion of the scope of works identified in Section 1.2:

- Excavation of approximately 189m2 to a depth of 51.49m RL - Assumed by EM&C to be equivalent with Australian Height Datum (AHD)
- Backfill of excavated material, over an area of 187m2 to a height of 51.49
- Offsite disposal of contaminated soil unsuitable for onsite reuse

It is incumbent upon the appointed Civil Contractor to adhere to not only the controls and procedures presented within this CEMP, but also with all relevant legal and regulatory requirements identified in Section 3 and any additional requirements, which might be supplied by Council as part of the planning approval process.

These management plans are presented to be a minimum standard to be adhered to, but are not exhaustive in their requirements. The appointed Principal Contractor is to work with the Civil Works Contractor in ensuring the goals of the plans are met, which may include the implementation of additional controls not mentioned within this document.

It should be noted that some overlap will exist with management plans. In this instance, it is important to apply the appropriate controls to manage the risks associated with each environmental hazard.

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4.1. ENVIRONMENTAL EMERGENCY RESPONSE MANAGEMENT PLAN

This Environmental Emergency Response Plan should be viewed as complementary to the appointed Principle Contractor's Project Health & Safety Plan and any identified Emergency Response Procedures within this plan.

Environmental incidents on the site, which would require potential emergency response would relate to a spill of a hazardous liquid or material at the site, which may contaminate soils, enter the stormwater system, exposed utility trenches and potentially impact local waterways. For spills on land, the following shall be undertaken:

- Identify source of spill and control the spill source when safe to do so.
- Identify area of spill and clear area of all personnel.
- Notify Principal Contractor of spill.
- Where possible, utilise spill kits available to protect drains/pits and absorb / contain spills and/or construct an earthen bund to contain spill using earth moving equipment available on site.
- Prevent migration of contaminants from site into stormwater or sewerage systems.
- Contractor to coordinate the pumping of liquid waste out of the containment structure and disposal to a licensed waste facility. If spilt material is non-liquid, the Civil Contractor shall coordinate the excavation and removal of the hazardous material to a secure area.
- Consultant shall assess the location of the environmental incident for potential loss to ground and advise the appointed Civil Contractor on required control or remediation measures.
- Assess the severity of the spill and potential impact on surrounding premises and if required, notify the regulator and/or fire brigade of the incidents.

Table 4.1a Local Emergency Services

Service	Phone Number	Address
Police	13 14 44	Liverpool Street Hobart
Fire Brigade	000	
Poison Information Centre	131 126	NSW

Table 4.1b. Regulatory Agencies

Agency	Contact	Phone Number
EPA	Enquiries (TAS)	03 6233 6518
Work Safe / Work Cover	Enquiries (TAS)	1300 555 727
Stormwater & Roads	Hobart City Council	03 6238 2711
Sewer	TasWater	13 69 92

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4.2. UNDERGROUND SERVICE PROTECTION MANAGEMENT PLAN

Objective:

To ensure underground services are protected not only from damage, but also the spread of contamination emanating from the works area, during the completion of Civil Works.

Procedure:

The Civil Contractor shall undertake a survey of all underground services and below ground assets prior to breaking ground. The process of pre-ground clearance shall be:

- Review of company construction plans;
- Dial Before You Dig (DBYD) search enquiry.
- Consultation with any utility company with a critical asset identified on the DBYD enquiry.
- Engagement of a trained service locator to identify and physically mark out located services.
- Services should be marked onsite using a combination, where appropriate, of colour coded paint and marker pegs/flags. Marker colours should be consistent with the relevant Australian Standard.
- Determine the type of service encountered (eg power, water supply, drainage etc.) and relevant details such as voltage in the case of power, composition (pvc, asbestos cement etc) and burial type (direct buried, encased etc). Note this information may not always be at hand.
- Ensure that drawings are current and arrange replacement plans should the supplied plans be out of date.
- Update safe work method statements (SWMS) where required to reflect identified services
- Consult with workers to ensure identified services have been effectively communicated to relevant staff. Ensure workers are aware of any changes to SWMS.
- When working alongside services to be retained, it may be required to positively identify underground assets prior to mechanical excavation. Positive identification of services should be conducted by non-destructive methods such as non-destructive drilling.
- Conduct a risk assessment, incorporating all reasonable controls that may be implemented to reduce the risk of contacting power lines in doing the planned task.
- Service approach distances must be adhered to. If workers are unsure what this distance is, clarity should be sought from the asset owner.

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4.3. CONTAMINATED SOIL/WATER MANAGEMENT PLAN

Objective:

To minimise the risk posed by potentially contaminated soil or water contaminants to onsite workers during the proposed development.

Procedure:

The Civils Works Contractor shall undertake a risk assessment/ JSA to determine the need for additional soil or groundwater testing to be undertaken during the works program to ensure workers are not exposed to an unacceptable level of risk from direct contact (which includes dermal contact, incidental oral ingestion and dust inhalation) with contamination.

The following contaminants may be present at the site in the form of contaminated soil or water, at concentrations above background levels:

- TPH (Petroleum Hydrocarbons/Fuel)
    - Due to the identified site history
- PAH (Polycyclic Aromatic Hydrocarbons)
    - Due to the identified site history, and PAHs identified during the PESA

The previously completed PESA concluded that based on the samples taken - the assessed soil did not contain contaminants at a concentration above what is prescribed as acceptable for intrusive maintenance workers.

As a matter of precaution, the following controls should be implemented:

- Where possible, avoid personally handling onsite soil or water, even when wearing personal protective equipment (PPE)
- Use mechanical aids to handle soil and water, for example:
    - Using trowels rather than hands to scrap small quantities of soil away
    - Use excavators for large quantities of soil
    - Use pumps to move water in preference to dunking buckets into water bodies
- Wear task specific PPE. The type will be selected by the Civil Works Contractor, however the following should be considered when selecting appropriate PPE.
    - When there is potential for hands to come into contact with onsite water (such as water that has been sitting within an excavation) waterproof/resistant gloves should be selected in preference to cut resistant gloves.
    - Chemical resistant gloves should be used when handling chemicals, rather than purely water resistant gloves
    - Safety glasses should be worn where there is a chance for splashes to workers. Face shields may be required in certain circumstances

It should be noted however that unexpected contamination finds may occur, in which case the subsequent processes should apply. Some examples of observations requiring further assessment include:

- Observation of free phase petroleum products
- Observation of leaking chemical containers within the work area
- Observation of either confirmed or suspected asbestos, or asbestos containing material (ACM)
- Spill of chemicals used onsite, causing the chemical to become exposed to the atmosphere, soil or water
- Observation of a fuel/chemical odour in soil or groundwater within the works area

Should an unexpected contamination find occur, the Environmental Consultant should be contacted immediately.

For the purpose of environmental sample collection, confined spaces are not to be entered. Where necessary samples shall be collected removed with either the aid of hand augers with extendable bars or with the assistance of an excavator or other mobile plant.

Should further assessment occur identifying that contamination is present at concentrations exceeding what is deemed to be acceptable within the NEPM as advised by the Environmental Consultant, further controls may be needed and a risk assessment should be performed to identify and document these requirements.

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4.4. CONTAMINATED VAPOUR/AIR MANAGEMENT PLAN

Objective:

To minimise the risk posed by potentially contaminated vapours/airborne contaminants to workers and surrounding properties.

Procedure:

The Civils Works Contractor shall undertake a risk assessment/ JSA to determine the need for atmospheric monitoring; or if the risk assessment cannot readily define a risk score rating, Health and Safety Monitoring programs may be required.

The following contaminants may be present at the site in vapour/particulate form, at concentrations above background levels:

- TPH (Petroleum Hydrocarbons/Fuel)
    - Due to the identified site history
- PAH (Polycyclic Aromatic Hydrocarbons)
    - Due to the identified site history, and PAHs identified during the PESA
- Fibrous asbestos cement fragments
    - Due to the identified site history

Other airborne contaminants may be present and should be considered by the Civil Works Contractor.

The material to be encountered during the project has contamination levels **not anticipated to cause adverse effects to human health provided that standard precautionary measures are taken in the handling of these materials.** The main pathways of contaminants entering the body are through inhalation, digestion and absorption so through implementing good work practices, the potential for contact with these is minimal.

Lower Explosive Limit (LEL) monitoring is **not required** to be undertaken as part of this project, based on the level of volatile organic compounds identified within the PESA.

It should be noted however that unexpected contamination finds may occur, in which case the subsequent processes should apply. Some examples of contamination requiring vapour assessment include:

- Observation of free phase petroleum products
- Observation of leaking chemical containers within the work area
- Observation of either confirmed or suspected asbestos, or asbestos containing material (ACM)
- Spill of chemicals used onsite, causing the chemical to become exposed to the atmosphere
- Observation of a fuel/chemical odour in soil or groundwater within the works area

Should an unexpected contamination find occur, the Environmental Consultant should be contacted immediately. The following action levels and response criteria are presented with appropriate control measures. Monitoring is to be conducted continuously in the designated work area. Action level exceedances are to be recorded.

For the purpose of environmental sample collection, confined spaces are not to be entered. Where necessary samples shall be collected removed with either the aid of hand augers with extendable bars or with the assistance of an excavator or other mobile plant.

Table 4.4.1 Vapour Action Levels

Meter/ Action Limit	Location	Duration	Action
LEL Meter - <5 % of lower explosive limit (LEL)	Ambient air in work area	Instantaneous	Continue monitoring.
LEL Meter - >5 % of LEL	Ambient air in work area	Instantaneous	Stop work; move upwind while vapours dissipate. Investigate source if safe to do so. If elevated levels remain, evacuate upwind and notify the principal contractor.
PID - >50ppm	Ambient air in work area	Instantaneous	Stop Work and notify the principal contractor. Unsafe conditions may be present which need additional safety control in place before recommencing work.
LEL Meter: <18% Oxygen Carbon Monoxide 30ppm Hydrogen Sulphide 10ppm	Excavation/ Pits	Instantaneous	No entry into pit. Atmosphere is unsafe. If these readings are also in the ambient air in the work zone evacuate upwind and notify the principal contractor.

Should asbestos containing materials be identified at the site, the Environmental Consultant is to be contacted immediately. Strict adherence with regulatory guidelines will be required to ensure that no asbestos fibres are released into the atmosphere. Onsite workers are to be alerted to the presence of ACM.

Air quality monitoring for asbestos fibres will be undertaken at the boundaries of works being conducted (or as determined by the Occupational Hygienist engaged by the Environmental Consultant to conduct the monitoring) during the asbestos removal works. Monitoring locations will be dependent on the site activities and environmental conditions.

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4.5. DUST AND ODOUR MANAGEMENT PLAN

Objective:

The objective is to minimise dust and/or offensive odours originating from site activities, including wind-blown and traffic generated dust.

Procedure:

The Civil Works Contractor shall ensure adequate controls are in place to mitigate against the generation of airborne dust and odour. The application of control methods is to be at the discretion of the Civil Works Contractor, however should the following scenarios occur, further controls must be implemented to achieve the management plan objective:

- Significant quantities of visible dust blowing from the work area, into an area where it may be considered a nuisance
- Receipt of a complaint from a nearby land user, which may include residents, occupants or pedestrians (temporary occupiers).

Dust and odour control will be achieved by applying one or more of the following actions as deemed appropriate by the Civil Works Contractor, or mandated by the satisfaction of either of the two trigger scenarios listed above:

- Application of water to soils during excavation and stockpiling activities to suppress the emission of dust from the work zone.
- Works generating the dust emissions will cease, so that emissions of visible dust cease.
- Covering stockpiles with plastics sheets and weights if wind conditions direct dust and odour off-site, or if offensive odours presents a nuisance to site workers.
- Applying odour suppressants to stockpiles and exposed soils in excavations if offensive odours continue to migrate off-site.
- Asphalt and concrete paved areas will be maintained for as long as reasonably practical during demolition and recycling works to minimise the extent of exposed soil, facilitating the generation of dust both on and off site.
- Unsealed haul roads (if applicable) will be appropriately sealed to prevent dust generation.
- Enforce speed limits for vehicles onsite
- Equipment will be operated in a proper, efficient and correct manner which includes proper maintenance in order to minimise exhaust emissions.
- Odour emissions from the site which could adversely affect air quality or the amenity of the local area are to be monitored. Should monitoring warrant further mitigation measures, an odour misting system will be utilised for spraying of odour suppressants along the perimeter of the works zone or site perimeter to minimise potential odours associated with the works.
- Deploying odouriser by hand along the perimeter of the site to mask odours.
- The areas exposed during demolition (dust or odour generating) at any one time will be minimised wherever possible by undertakings works in a localised progressive manner over the site; and
- Weather forecasts will be checked daily to program works for the following day.
- Erection of dust screens along the perimeter of the work area, or in some instances along the site perimeter.
- Covering soils in haulage trucks prior to leaving the site to reduce dust and offensive odours impacting upon the surrounding environment and the receiving landfill facility.

If the control measures identified in this procedure are not successful in preventing offensive levels of odour or dust leaving the site, fieldworks will cease until the levels reduce to acceptable levels, or until more effective mitigation measures can be implemented.

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4.6. SEDIMENT AND RUNOFF MANAGEMENT PLAN

Objective:

To minimise soil erosion leading to sediment leaving the controlled work area through run-off.

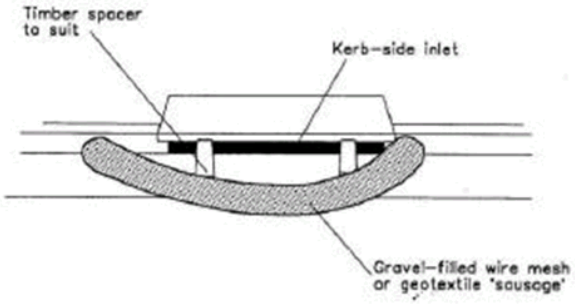
Procedure:

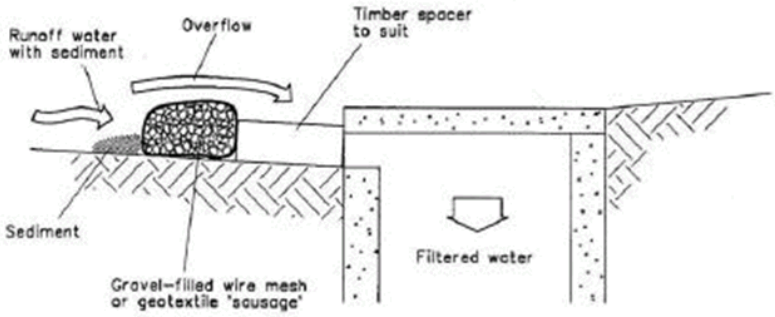
Sediment may be generated on site by the erosion of exposed areas (such as excavations) and stockpiles. The Civil Works Contractor shall ensure migration of sediment outside of the work area is prevented.

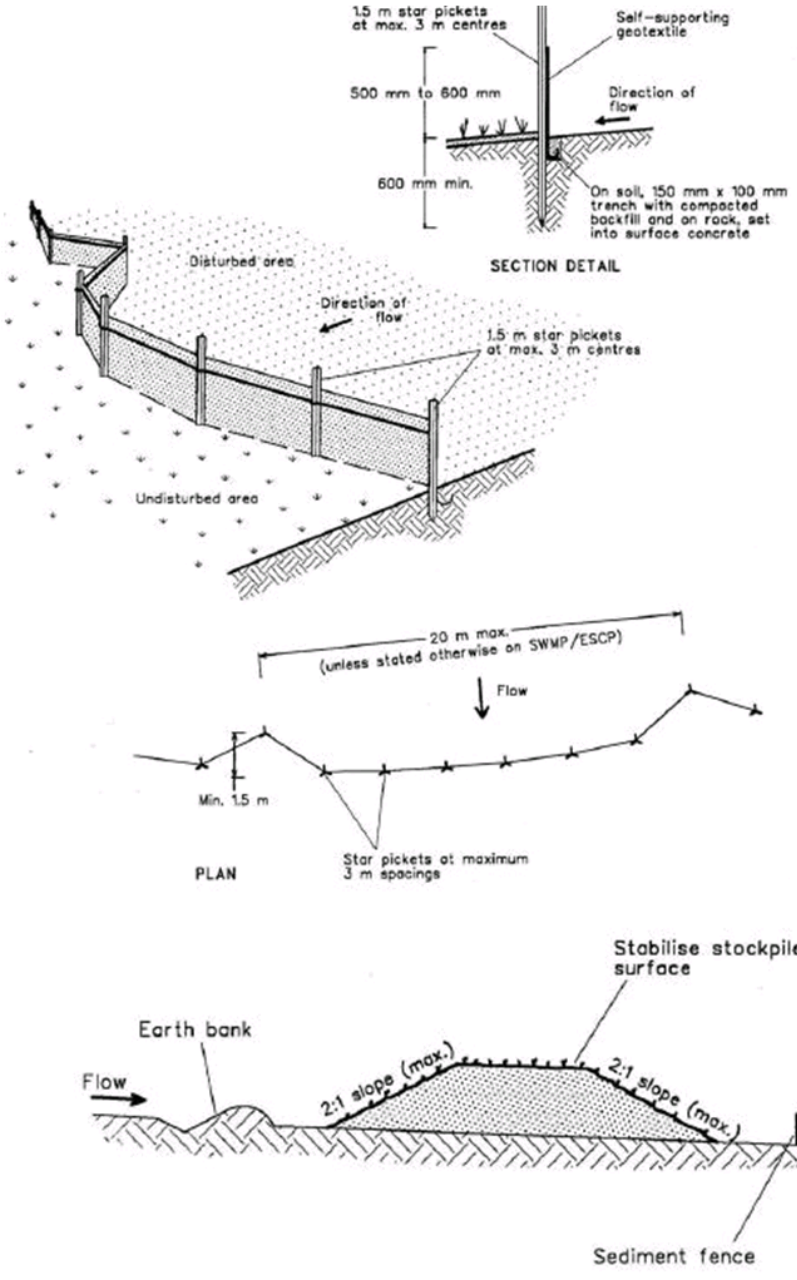
The following mitigation measures are provided as guidance to Civil Contractor. Should any turbid water be identified to be leaving the work area, one, or a combination of these mitigation measures will be mandatory to ensure the management plan objective is achieved:

- Identification of the construction activities that could cause soil erosion or discharge sediment or water pollutants from the site.
- Identification of all storm water drains and pits on site and the assessment of required sediment controls.
- Maintain existing site boundary stormwater channels where possible to capture stormwater and silt runoff before it can enter adjacent roads, drains or off-site water bodies.
- Existing storm water infrastructure (down piping, shallow drains) will be maintained until removed as part of demolition or remediation works. Where there are former services linking to these areas that cannot be removed, they will either be capped off, or allowed to drain with appropriate sediment controls such as geo fabric, silt fences, sandbags, hay bales and silt traps (whatever is appropriate).
- Installation of silt fencing on the down gradient site boundaries where surface rainfall run-off occurs.
- Fencing is to be installed before excavation works commence and are to be routinely inspected (at a rate determined by the Civil Works Contractor) and following significant rainfall events (over 10mm rainfall within 24 hours).
- Areas of bare surfaces will be minimised during construction and stabilised as soon as practicable.
- Establishment of bunds (e.g. hay bales) where stockpiling of soil is required. Plastic sheets (minimum 200µm thickness) should be used as a base for the stockpile bund in unpaved areas to prevent contaminants leaching into the subsurface.
- Covering soil stockpiles with plastic sheets.
- Construction vehicles will use sealed roads wherever possible to prevent any loss of load, whether dust, liquid or soils.
- All vehicles tyres to be clean before exiting the site.
- Reinstatement of surface cover materials at the completion of project (either landscaping or hard surfaces) to remove areas of unsealed & uncovered ground.
    - This will depend to a large degree on the proposed finished ground surface planned.

Examples of sediment control options for kerb and gutter systems and stockpile management are presented below:


Timber spacer to suit
Kerb-side inlet
Gravel-filled wire mesh or geotextile 'sausage'


Runoff water with sediment
Overflow
Timber spacer to suit
Sediment
Filtered water
Gravel-filled wire mesh or geotextile 'sausage'


1.5 m star pickets at max. 3 m centres
Self-supporting geotextile
500 mm to 600 mm
Direction of flow
600 mm min.
On soil, 150 mm x 100 mm trench with compacted backfill and on rock, set into surface concrete
SECTION DETAIL
Disturbed area
Direction of flow
1.5 m star pickets at max. 3 m centres
Undisturbed area
20 m max.
(unless stated otherwise on SWMP/ESCP)
Flow
Min. 1.5 m
Star pickets at maximum 3 m spacings
PLAN
Stabilise stockpile surface
Earth bank
Flow
2:1 slope (max.)
2:1 slope (max.)
Sediment fence

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4.7. NOISE MANAGEMENT PLAN

Objective:

The objective is to control onsite noise as to comply with regulatory noise limits.

Procedure:

The Civil Works Contractor shall ensure compliance with regulatory standards along with Council noise restrictions and limited site work hours in the table below and any additional stipulated requirements of Council.

Noise Exclusion Times within TAS

Monday to Friday	Before 7am and after 6pm.
Saturday	Before 9am and after 6pm.
Sunday & Statutory Holidays	Before 10am and after 6pm.

The following work practices are recommended to be employed at the discretion of the Civil Works Contractor. Should a complaint be received, one or more of the following control measures become mandatory.

- Where possible, all site noise sources will have a maximum operating noise level of 85db (A).
- The conditions of exhaust systems on the excavators and other heavy machinery will be quantitatively assessed to ensure that they are operating efficiently.
- If generators or pumps or other noisy equipment are required for use on the site, they will be properly shrouded to reduce emitted noise levels. It is noted that some equipment will likely be required to be operated continuously.
- An Environmental Complaints Register will be maintained to ensure that any concerns of local residents and members of the public are recorded and addressed.
- Concerns over noise generation will be communicated to all site personnel and sub-contractors during site inductions.

In the event that noise complaints are received, works will cease and the appointed Civil Works Contractor or Environmental Consultant will notify the Principal Contractor. The source of the noise leading to the complaint will be investigated and methodologies reviewed to mitigate the nuisance to local residents.

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4.8. VIBRATION MANAGEMENT PLAN

Objective:

Vibration generated from site activities to be controlled so as to avoid damage to on off-site buildings and structures.

Procedure:

A dilapidation survey of site buildings and surrounding off-site buildings to be undertaken by the appointed Civil Works Contractor at the discretion of the Principal Contractor before commencement of civil works.

If use of vibration is necessary to complete excavation backfilling, some minor vibration to surrounding properties should be expected. The following control measures should be considered by the Civil Works Contractor:

- Monitoring of vibration at boundary monitoring points for the potential for off-site vibration to cause structural damage.
- If potential exist for vibrations to cause damage to off-site buildings, works shall cease and appointed Civil Works Contractor and Principal Contractor shall review construction methodologies to mitigate this risk to an acceptable level.
- Any works which may cause excessive vibration (such as hammering or compaction) will be restricted as much as possible against neighboring properties.

In the event that vibration/damage complaints are received, works will cease and the appointed Civil Works Contractor or Environmental Consultant will notify the Principal Contractor. The source of the vibration leading to the complaint will be investigated and methodologies reviewed to mitigate the nuisance or damage to local receptors.

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4.9. SOLID AND LIQUID WASTE MANAGEMENT PLAN

Objectives:

Ensure the waste management hierarchy is utilised to optimise environmental outcomes associated with waste management. All solid and liquid waste to be both managed and disposed of off-site in accordance with Tasmanian Waste Management Regulations.

Procedure:

The Civil Works Contractor must make decisions on waste management for both solid and liquid waste should they arise. In this situation, the Civil Works Contractor shall consider the hierarchy of waste control, adopting preferred methods before seeking alternative methods such as the least preferred options. The process is described below.

The Waste Hierarchy Picture, Source: NSW EPA, Waste Avoidance and Recovery Strategy.

Previous investigations at the site are detailed within the PESA report. The investigation identified that certain materials need to be handled, stored and in some instances disposed of in a particular manner. There is also potential for additional waste streams to be generated during the proposed work scope, and should be managed accordingly. Table 4.9.1 and 4.9.2 (on following page) detail the management options available to the Civil Works Contractor.

Table 4.9.1 Identified Solid and Liquid Waste Summary Options

Waste Stream	Waste Management Options
Excavated soil situated below the building footprint, identified within Attached Figure 2 as the red hatched area.	1. Avoid unrequired excavation. 2. The material is suitable for onsite reuse within the area proposed for 'fill' within drawing number NHO_K 003 (Appendix B), which is to be a covered terrace area, and contained within a blockwork retaining wall. This area is also identified within attached Figure 2 as a purple shaded area. a. This conclusion is made on the basis that ecological screening levels are not applicable, due to the absence of ecological receptors within this area. 3. The material is unsuitable for reuse anywhere onsite where ecological screening levels apply, which are unsealed areas at a depth of less than 2 meters below ground surface, which is representative of root and habitation zones of many flora and fauna species. Examples of such areas unsuitable for reuse of excavated material includes (but is not limited to): a. Grassed areas; b. Garden beds; and c. Other unsealed areas 4. Should the above options not be possible, the material will need to be disposed of offsite to a licensed landfill. The concentration of benzo(a)pyrene within the soil would presently see this material classified as Contaminated Soil/Level 3 under the Tasmanian waste classification guidelines IB105 if removed from the site. a. Should the excavated material be removed from site, the soil is to be handled in accordance with Tasmanian Soil Disposal Guidelines[10]. b. Such a course of action will require obtaining approvals from the Tasmanian EPA and the receiving landfill which may take approximately two – three weeks. During this time, the soil is to be stockpiled in accordance with the management plans included within this CEMP document.
Demolished Concrete footings, asphalt including minor steel reinforcement	1. Minimise area surface demolition to reduce volume of waste stream. 2. If concrete is stained and odourous, consider cleaning surface to increase disposal options. 3. Explore recycling or repurposing opportunities. 4. Dispose to landfill if no other viable options.

Table 4.9.2 Potential Project Waste Stream Management

Waste Stream	Waste Management Options
Asbestos Containing Material (ACMs)	1. Asbestos Containing Material (ACMs) have not been identified at the site to the knowledge of EM&C, however all demolitions project should be prepared to manage ACMs to ensure worker and public safety is maintained. 2. Further advice on 'How to Manage and Control Asbestos in the Workplace' is provide at the Safe Work Australia web page https://www.safeworkaustralia.gov.au/system/files/documents/1810/model-cop-how-to-manage-and-control-asbestos-in-the-workplace_0.pdf 3. Any project generated ACM waste stream shall be managed in accordance with the Tasmanian Waste Management Regulations and in accordance with WorkSafe Tasmania guidelines.

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4.10. EXCAVATION DEWATERING MANAGEMENT PLAN

Objectives:

Ensure any water encountered in and removed from excavations is managed correctly and does not migrate from the works zone into an area where it could cause environmental harm or nuisance.

Procedure:

During intrusive investigations during the PESA, **no shallow groundwater was encountered, indicating the presence of groundwater accumulating within the excavation is low.** Rainfall falling directly into the excavation, or from surface water runoff may accumulate within the excavation.

Utilising the hierarchy of waste management listed in section 4.9 above, the following process should be followed:

1. Onsite reuse as dust suppression (pending suitability)
2. Off-site disposal:
    a. Via licensed waste management contractor, or
    b. Discharged to Sewer with the prior consent of TasWater; or
    c. Discharged to Stormwater with the prior consent of local council.

Should offsite disposal, either to a utility or a waste contractor be required, the Civil Works Contractor must contact the Environmental Consultant to determine which disposal options may be available based on the water quality. The process in determining the applicability of disposal options may take hours to several weeks, depending on the water quality encountered. The Civil Works Contractor in consultation with the Environmental Consultant shall obtain prior approval from the receiving authority (either TasWater or local council) prior to the discharge of any water removed from excavation area.

To reduce the volume of water entering open excavation from rainfall run-off events, consideration shall be given to backfilling all open excavation as soon as possible. Where excavations cannot be quickly backfilled, efforts should be made to divert surface water run-off away or around the open excavation.

Where water is to be removed from site by a licensed waste disposal contractor, the process of removal shall be documented. This includes the details of the water disposal contractor, the volume and date of water removed, details of any completed water analysis, details of the receiving water treatment facility for licensed disposal facility. Disposal dockets shall be retained for waste tracking purposes.

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4.11. IMPORTED FILL MANAGEMENT PLAN

Objectives:

Material imported to the site for the purpose of filling excavations shall be suitable for site's existing commercial/industrial land use as defined by the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 and should also conform to the 'fill material' standard defined within the EPA Tasmania Information Bulletin 105 *'Classification and Management of Contaminated Soil For Disposal'*, Nov 2012.

Procedure:

To address the objective, imported fill material shall be either:

- Certified as virgin quarry source material (VQSM) and shall be free of debris or waste inclusion, and shall also be free of contamination.
- Subject to approval by the Client and Principal Contractor, Material certified by an EIANZ Certified Environmental Practitioner (CEnvP) Contaminated Site Specialist (CS) or a Contaminated Site Auditor recognised by the Director of the Tasmanian EPA, as:
    - 'Fill material' in accordance EPA Tasmania Information Bulletin 105 *'Classification and Management of Contaminated Soil For Disposal'*, Nov 2012, and
    - Within the current and intended land use criteria as defined by the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013
- Records of fill material certification (in either of the scenarios listed above) shall be supplied to the Principal Contractor.

The Principal Contractor shall be notified if imported fill material does not conform to the above requirements. This material shall be deemed unsuitable for use on site and must be removed from site. Depending on the level of material contamination, there may also be a statutory requirement to notify Council and the EPA.

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4.12. EXCAVATION REINSTATEMENT MANAGEMENT PLAN

Objectives:

Excavation reinstatement to meet the specified requirement(s) of the Principal Contractor.

Procedure:

At the completion of each days work, the Civil Works Contractor shall ensure the area of exposed excavation is made safe to prevent public entering the excavation and reduce the risk of excavation face collapse, which has potential to cause injury and damage to buildings.

At the project completion the excavation is to the reinstated to the specified requirement(s) of the Principal Contractor.

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4.13. TRAFFIC MANAGEMENT PLAN

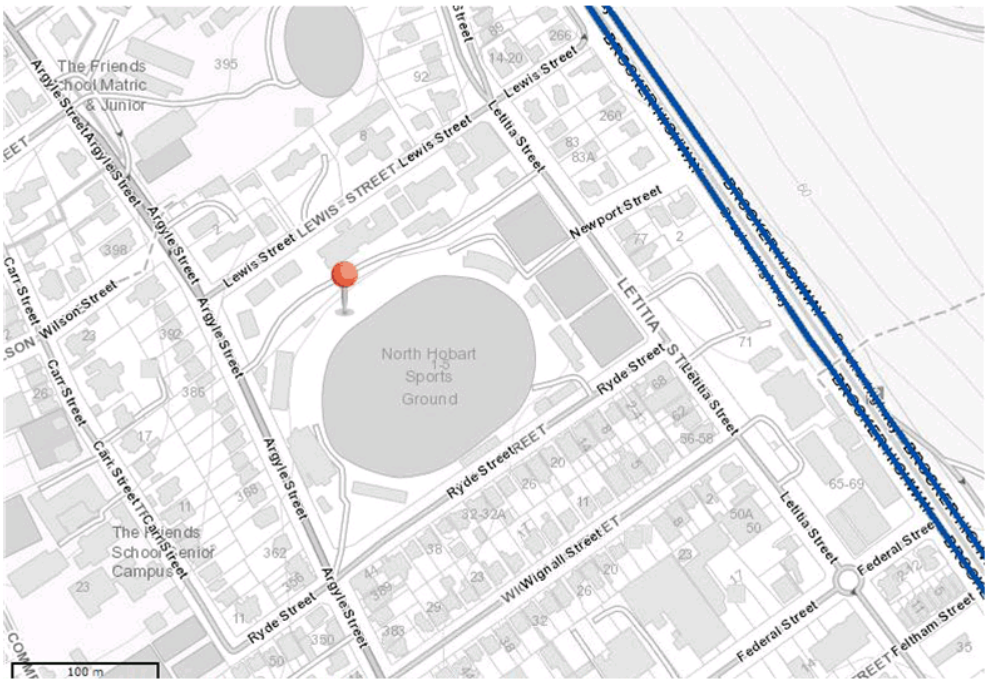
Objectives:

Minimise the impact of heavy vehicle traffic movements on local roads, surrounding residents, the community and businesses.

Procedure:

The Civil Works Contractor shall have a Traffic Control Plan in place for the movement of heavy vehicles in and out of the site in order to meet the management objective. The development of a Traffic Control Plan may indicate the requirement to engage a suitably qualified professional to develop a Traffic Management Plan for consideration by the road network owner.

Adjacent road ownership is indicated in the below image with grey representing local council ownership, dark blue representing State owned infrastructure (Source: TheList).



The following steps should be considered to mitigate the impacts that associated traffic movements will have on nearby receptors:

- All transport vehicles to have proper noise attenuation and to be maintained in good order.
- Construction traffic should comply with construction noise limits and construction times to minimise noise impact on residents.
- Queuing will be forbidden in local streets. Truck movements will be staggered to prevent queuing occurring.

- Vehicle and machinery movements during works will be restricted to designated areas within the site; these areas will change during demolition and remediation works as required by work progress.
- Heavy and light vehicles will be separated by designated onsite parking for light vehicles, and restricting the use of unnecessary light vehicles around heavy vehicle movements.
- Oversize truck movements (predominantly floats) will only occur during approved hours and will not operate during peak traffic curfews.
- Traffic will be confined to maintain site tracks and roads.
- All vehicles will be restricted to the onsite speed limit of 20 km/hr.
- Adequate off-road parking will be provided for construction vehicles and construction workforce vehicles.
- Adequate room will be provided for vehicles to manoeuvre on the site.
- All heavy vehicles on site will have fitted, and will maintained, reversing lights and reversing alarms for onsite safety.
- In accordance with Section 4.5 Dust and Odour Management Plan, vehicles transporting material to and from the construction site will be covered immediately after loading (prior to traversing public roads) to prevent windblown dust emissions and spillages.
- In the event of a spillage of materials from construction vehicles, spilled material will be removed as soon as practicable within the working day of the spillage.

The Civil Works Contractor will be responsible for ensure the above conditions are met, working in conjunction with any sub-contractors they may engage. Should a safety or environmental incident occur, the Civil Works Contractor should:

- Stop the vehicle/personnel involved in the incident immediately (or as appropriate), operate warning lights and warn other drivers to slow down;
- Clear the spill in the event of a spillage – engaging appropriate safety standards as relevant to the event;
- In the event of a complaint or failure to comply with this plan, the Civil Works Contractor will investigate the complaint promptly and initiate appropriate action to reduce impact as per guidelines in this CEMP:
    - Undertake an investigation to determine the cause;
    - Undertake monitoring if required;
    - Modify transportation practices as necessary to reduce the duration or level of impact; and
    - Report the results of the investigation the client.

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4.14. PLANT AND VEHICLE DECONTAMINATION

Objectives: Prevent soil and other contaminants being spread from the work area into the surrounding environment

Procedure:

The Civil Works Contractor shall be responsible for ensuring earthmoving plant, vehicles and equipment, which comes into contact with contaminated, or potentially contaminated material shall be inspected for adhered soil build up. Where necessary, dirty plant, equipment and vehicles shall be cleaned before leaving the site.

Common areas on moving plant, equipment and vehicles for the build-up of soil contaminants may be:

- Tyre treads
- Plant tracks
- Wheel hubs
- Plant attachments such as buckets or compactor heads
- Air filters
- Body panels

Vehicle egress pathways from the site shall be periodically inspected and swept free of identified contaminated soil.

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4.15. SITE AMENITY

Objectives:

Maintain the general amenity of the site and surrounding area during and following the completion of the project

Procedure:

The site shall be maintained by the Civil Works Contractor to an acceptable standard to both the Principal Contractor and the general public. The following guidance steps comprise the site amenity procedure:

- Maintain site perimeter fencing in good condition without holes to prevent unauthorised access to the site.
- Construct soil stockpiles away from adjoining residential/commercial properties and do not exceed the height of site fences.
- Limit the extent of excavations and duration of time they are open as far as is reasonably practicable to achieve project objectives but maintain the site amenity.
- Keep solid waste piles tidy, away from site frontages and remove the waste from the site as soon as practicable.
- Remove litter, long grass and other debris frequently.
- Implement dust, odour, noise and vibration controls described in the sections above.
- At the completion of the project ensure the site is level with no wastes remaining on-site and no odorous soils at the surface that could prolong odour nuisance to the public.

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4.16. CULTURAL HERITAGE MANAGEMENT PLAN

Objectives:

To prevent disturbance to damage to areas of cultural or natural heritage value

Procedure:

The Civil Works Contractor is to determine prior to the start of intrusive works the presence of:

- Heritage overlays within the Council's planning scheme; and
- Aboriginal relics or apparent risk of impacting Aboriginal relics.

Should a search of the relevant databases indicate the presence of heritage impacts on the intended work scope, the Civil Works Contractor is to ensure:

- All personnel will attend a site induction that includes identification of heritage issues and requirements prior to the commencement of works (and/or the commencement of individual contracts).
- An exclusion zone and fencing will be installed around identified heritage items.
- If suspected indigenous or non-indigenous culturally significant material is found during works, work within 50 m must stop immediately, steps taken to prevent further disturbance, and the client notified, who will obtain expert advice from an appropriate qualified professional.
- Where culturally significant items are found on site, exclusion zones are to be established and clearly marked with tape, fencing or pegs.
- Only after written confirmation is given by the Principal Contractor in consultation with the relevant government agency, shall work recommence in the area.

In the event of non-compliance with this sub-plan the following corrective actions shall be taken:

- An investigation shall be undertaken to determine the cause;
- Work processes and practices shall be modified as necessary;
- Affected personnel shall undergo additional cultural heritage awareness training.

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4.17. FLORA AND FAUNA MANAGEMENT PLAN

Objectives:

To minimise the impact of the works plan to native flora and fauna, and to minimize the spread of noxious weeds.

Procedure:

Prior to the start of works, the Civil contractor is to determine if, at risk populations are present within the works area. Should such a population be identified, the following should be considered by the Civil Works Contractor

- Establish protected areas, to control the impact of works on at risk populations,
- Define access tracks to avoid at risk populations and mark these appropriately, and
- Implement sediment controls such as listed within Section 4.6.

Should any native fauna be found to be injured at the works site, the Civil Works Contractor is to contact a local animal rescue centre for advice.

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5. STATEMENT OF LIMITATIONS

This report has been prepared in accordance with the scope of services described in the contract or agreement between Environmental Management & Consulting Pty Ltd (EM&C) and the Client. The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client. Furthermore, the report has been prepared solely for use by the Client and EM&C accepts no responsibility for its use by other parties. The client agrees that EM&C's report or associated correspondence will not be used or reproduced in full or in part for promotional purposes and cannot be used or relied upon in any prospectus or offering.

No warranties express or implied are made. Subject to the Scope of Work, EM&Cs assessment is limited strictly to identifying typical environmental conditions associated with the subject property and does not include evaluation of the structural conditions of any buildings on the subject property or any other issues. Additionally unless otherwise stated EM&C did not conduct soil, air, wastewater or other matrix analyses including asbestos or perform contaminated sampling of any kind. Nor did EM&C investigate any waste material from the property that may have been disposed of off the site, nor related waste management practices.

The results of this assessment are based upon site inspection conducted by EM&C personnel, information from interviews with people who have knowledge of site conditions and information provided by regulatory agencies. All conclusions and recommendations regarding the property are the professional opinions of the EM&C personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability have been made, EM&C assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of EM&C, or developments resulting from situations outside the scope of this project.

EM&C is not engaged in environmental auditing and /or reporting of any kind for the purpose of advertising sales promoting, or endorsement of any clients' interests, including raising investment capital, recommending investment decisions, or other publicity purposes. EM&C assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of EM&C, or developments resulting from situations outside the scope of this project.

Information relating to soil, groundwater, waste, air or other matrix conditions in this document is considered to be accurate at the date of issue. Surface, subsurface and atmospheric conditions can vary across a particular site or region, which cannot be wholly defined by investigation. As a result, it is unlikely that the results and estimations presented in this report will represent the extremes of conditions within the site that may exist. Subsurface conditions including contaminant concentrations can change in a limited period of time and typically have a high level of spatial heterogeneity.

From a technical perspective, there is a high degree of uncertainty associated with the assessment of subsurface, aquatic and atmospheric environments. They are prone to be heterogeneous, complex environments, in which small subsurface features or changes in geologic conditions or other environmental anomalies can have substantial impact on water, air and chemical movement.

Major uncertainties can also occur with source characterization assessment of chemical fate and transport in the environment, assessment of exposure risks and health effects, and remedial action performance. These factors make uncertainty an inherent feature of potentially impacted sites. Technical uncertainties are characteristically several orders of magnitude greater at impacted sites than for other kinds of projects.

EM&C's professional opinions are based upon its professional judgment, experience, and training. These opinions are also based upon data derived from the limited testing and analysis described in this report. It is possible that additional testing and analysis might produce different results and/or different opinions or other opinions. EM&C has limited its investigation(s) to the scope agreed upon with its client. EM&C believes that its opinions are reasonably supported by the testing and analysis that has been undertaken (if any), and that those opinions have been developed according to the professional standard of care for the environmental consulting profession in this area at this time. Other opinions and interpretations may be possible. That standard of care may change and new methods and practices of exploration, testing and analysis may develop in the future, which might produce different results.

EM&C is not in the business of providing legal advice.

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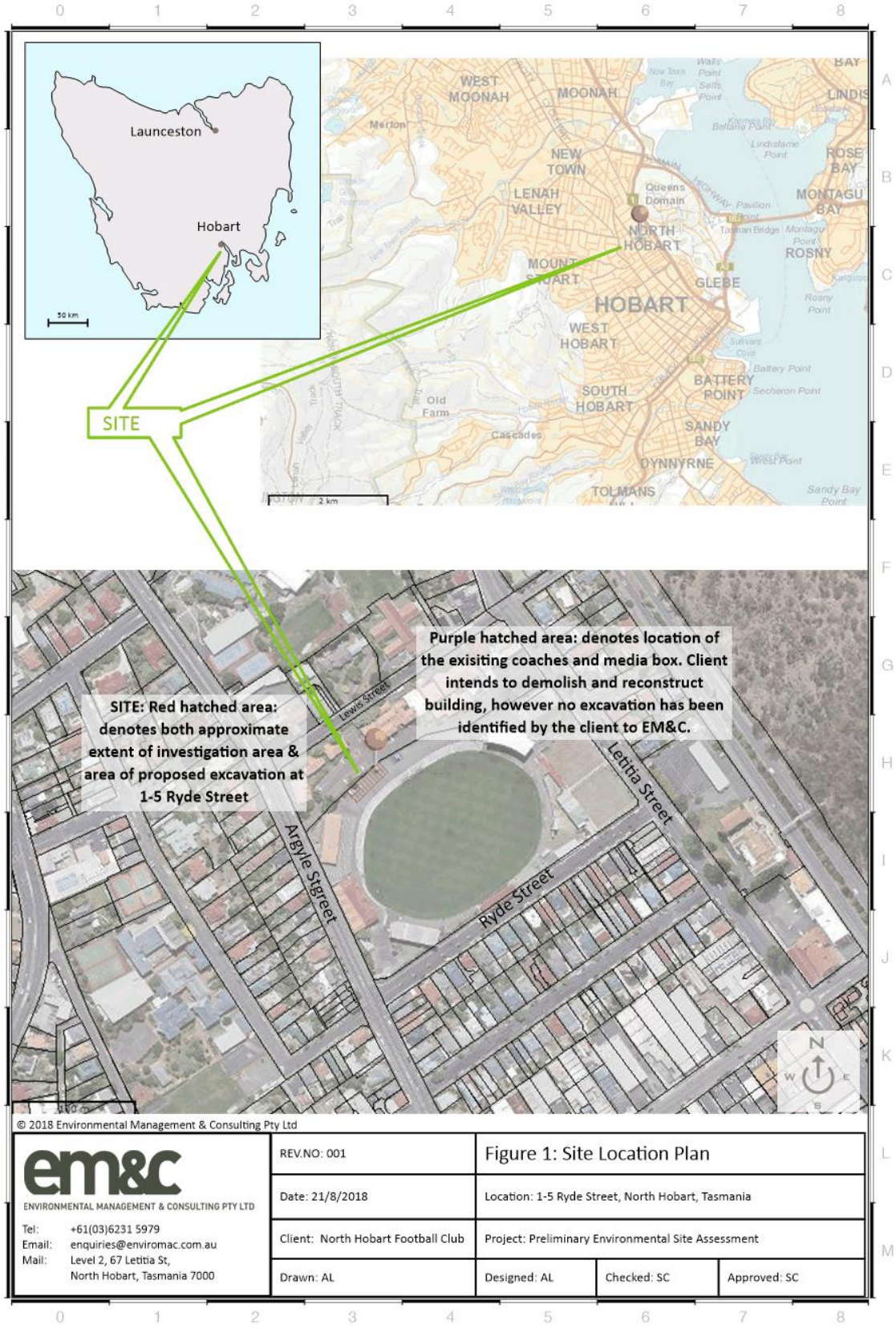
FIGURES



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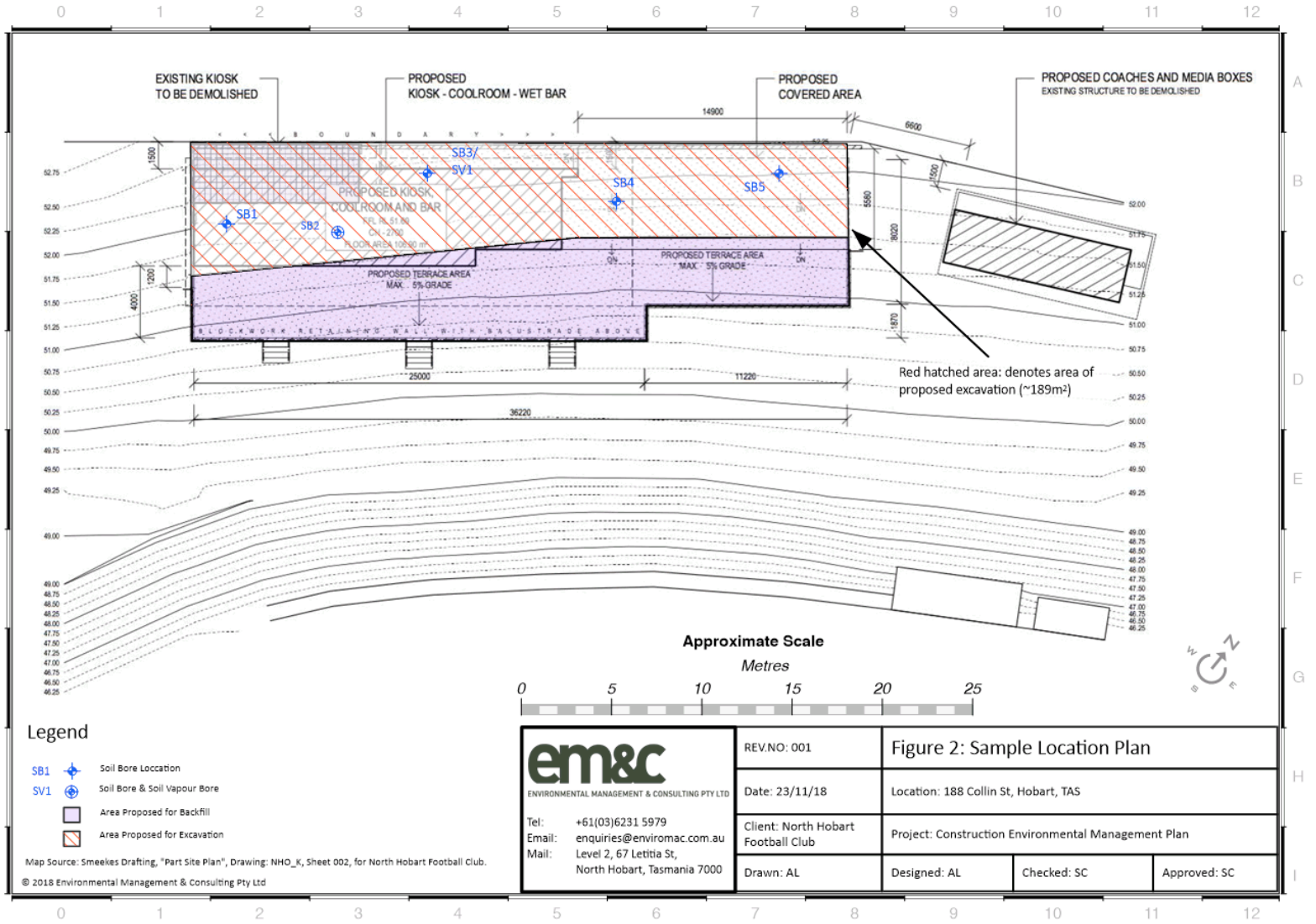
ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD
Tel: +61(03)6231 5979
Email: enquiries@enviromac.com.au
Mail: Level 2, 67 Letitia St, North Hobart, Tasmania 7000

REV.NO: 001	Figure 1: Site Location Plan		
Date: 21/8/2018	Location: 1-5 Ryde Street, North Hobart, Tasmania		
Client: North Hobart Football Club	Project: Preliminary Environmental Site Assessment		
Drawn: AL	Designed: AL	Checked: SC	Approved: SC


EXISTING KIOSK TO BE DEMOLISHED
PROPOSED KIOSK - COOLROOM - WET BAR
PROPOSED COVERED AREA
PROPOSED COACHES AND MEDIA BOXES
EXISTING STRUCTURE TO BE DEMOLISHED
BOUNDARY
SB1
SB2
SB3/ SV1
SB4
SB5
PROPOSED KIOSK COOLROOM AND BAR
PROPOSED TERRACE AREA MAX. 5% GRADE
BLOCKWORK RETAINING WALL WITH BALUSTRADE ABOVE
Red hatched area: denotes area of proposed excavation (~189m²)
Approximate Scale
Metres
0 5 10 15 20 25
Legend
SB1 Soil Bore Loccation
SV1 Soil Bore & Soil Vapour Bore
Area Proposed for Backfill
Area Proposed for Excavation
Map Source: Smeekes Drafting, "Part Site Plan", Drawing: NHO_K, Sheet 002, for North Hobart Football Club.
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ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD
Tel: +61(03)6231 5979
Email: enquiries@enviromac.com.au
Mail: Level 2, 67 Letitia St, North Hobart, Tasmania 7000
REV.NO: 001
Figure 2: Sample Location Plan
Date: 23/11/18
Location: 188 Collin St, Hobart, TAS
Client: North Hobart Football Club
Project: Construction Environmental Management Plan
Drawn: AL
Designed: AL
Checked: SC
Approved: SC

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Appendix A

Preliminary Environmental Site Assessment, Environmental Management and Consulting.

Issued 26 August 2018.

LEVEL 2 BIGGINS BLD. NORTH HOBART TAS p. 03 6231 5979 e. enquiry@enviromac.com.au w. enviromac.com.au

Report Prepared for:

North Hobart Football Club

Prepared by:

Environmental Management & Consulting Pty Ltd

ABN: 17 273 533 294

Office/ Mail: Level 2, 67 Letitia St, North Hobart 7000, Tasmania

Assessment Design, Project Supervision and Report Prepared by:	**Simon Chislett** Principal Environmental Engineer, B.Eng (Env) Hons Environmental Management & Consulting Pty Ltd Certified Environmental Practitioner, Contaminated Site Specialist (CEnvP CS, EIANZ) EIANZ Certified Environmental Practitioner No: 1160 EIANZ Site Contamination Specialist No: SC400112 Email: simon@enviromac.com.au
Field work completed by:	**Alex Lovibond,** Senior Environmental Scientist, B.Sc (Env), LLB (Env) Environmental Management & Consulting Pty Ltd **Tom Latham,** Environmental Engineer, B.Eng (Hons) Civ. & Env, Environmental Management & Consulting Pty Ltd

DOCUMENT REVISION RECORD

Rev	***Date***	***Details of Revisions***
R01	*26/08/18*	*Preliminary Environmental Site Assessment*

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LIST OF COMMON REPORT ABBREVIATIONS

ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Above-ground Storage Tank
B(a)P	Benzo(a)Pyrene
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CARE	Contamination Assessment and Remediation of the Environment
COC	Chain Of Custody
COPC	Contaminants Of Potential Concern
CRC	Cooperative Research Centre
DO	Dissolved Oxygen
DQO	Data Quality Objective
DNAPL	Dense Non-Aqueous Phase Liquid
DSI	Detailed Site Investigation
DTW	Depth to Water
EC	Electrical Conductivity
EIL	Ecological Investigation Level
EM&C	Environmental Management & Consulting Pty Ltd
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
EPA	Environment Protection Authority
HIL	Health Investigation Level
HSL	Health Screening Level
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit Of Reporting
MAH	Monocyclic Aromatic Hydrocarbons
mBGS	Metres Below Ground Surface
mTOC	Metres below Top of Casing
NEPM	National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PH	Petroleum Hydrocarbon
PID	Photo-Ionisation Detector
PSI	Preliminary Site Investigation
PVI	Petroleum Vapour Intrusion
RPD	Relative Percentage Difference
SAQP	Sample Analysis and Quality Plan
TDS	Total Dissolved Solids
TOC	Top Of Casing
TPH/ TRH	Total Petroleum Hydrocarbons/ Total Recoverable Hydrocarbons
UST	Underground Storage Tank
VOC	Volatile Organic Compound
QA/QC	Quality Assurance/ Quality Control

List of Abbreviated Measurement Units

m: metre	L: Litre	ppm: parts per million
km: kilometre	kL: kilolitre	ppb: parts per billion
mg/kg: milligram/ kilogram	mg/L: milligram/ litre	
µg/kg: microgram/ kilogram	µg/L: microgram/ litre	

1. INTRODUCTION

This Preliminary Environmental Site Assessment (PESA) report has been prepared by Environmental Management & Consulting Pty Ltd (EM&C) to enable the Hobart City Council (HCC) to assess the proposed development for 1-5 Ryde Street, North Hobart (the 'site') against the provisions of the Potentially Contaminated Land Code (PCLC) – E2.6.2 of the Hobart Interim Planning Scheme 2015. The location of the site within the suburb of North Hobart and state of Tasmania is shown on attached Figure 1.

A copy of the architectural drawings for the proposed development have been provided to EM&C for consideration and are included for reference within Appendix A. In summary, the proposed development for a 'kiosk upgrade' is for the demolition and re-construction of a kiosk building, which will include a commercial kitchen, cool room, wet bar and outdoor partially covered terrace area. The combined excavation area is expected to be approximately 189m^2 and the expected infill area is expected to be approximately 187m^2. An additional area within the site, the existing coaches and media box is proposed to be demolished, and replaced with a new building, retaining the original building purpose.

EM&C have designed this assessment based on the supplied cut and fill plan provided by Smeekes Drafting Pty Ltd (Drawing number NHO_K 003, included in Appendix A). During the proposed development, the planned excavation is confined to the proposed kiosk upgrade area, to the exclusion of the coaches and media box. As a result, the soil assessment area has been confined to the kiosk area accordingly. This approach is justified based on the purpose of the Potentially Contaminated Land Code (PCLC) provided within the Hobart Interim Planning Scheme 2015 as to:

> *Ensure that use or development of potentially contaminated land does not adversely impact on human health or the environment.*

The area of proposed disturbance is shown in red hatched shading on attached Figure 1 and 2 and is also the area of investigation by this PESA report.

2. OBJECTIVE

This PESA has been designed to address the requirements provided within the PCLC, to determine if the proposed development *works involving excavation of potentially contaminated land…* [will] *…adversely impact on health and the environment.*[1]

The objectives of the completed PESA were to determine:

- Whether any site contamination presents a risk to workers involved in redevelopment of the site, or future users of the site, as a result of proposed excavation of the site.
- Whether any site contamination presents an environmental risk from excavation conducted during redevelopment of the site.

[1] PCLC E2.6.2, Hobart Interim Planning Scheme 2015

- Whether any specific remediation and/or protection measures are required to ensure the proposed excavation does not adversely impact human health or the environment before excavation commences.
- If offsite disposal of soil is required, classify the soil within the definitions provided within the Tasmanian EPA publication *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal.*

3. APPLICATION OF WORSCOPE TO PLANNING SCHEME

This assessment seeks to assess the condition of the site against the performance criteria supplied within the planning scheme, along with HCCs anticipated request for such an assessment.

The proposed excavation at the site triggers the application of the Potentially Contaminated Land Code. Section E2 of the HCC Interim Planning Scheme 2015 identifies where the PCLC applies:

E2.2.1

This Code applies to:

(a) a use, on potentially contaminated land, that is a sensitive[2] use, or a use listed in a use class in Table E2.2.1 and is one of the uses specified as a qualification; or
(b) development on potentially contaminated land.

Development is further defined within Section E2.6 to include either subdivision or excavation. The extent of excavation required to trigger the application of the PCLC through development is limited by Section E2.4.4, to only apply when the area of land disturbed by the development exceeds one square meter.

The code defines potentially contaminated land within Part E2.3.1:

...land that is, or adjoins land that the applicant or the planning authority:

a. Knows to have been used for a potentially contaminating activity by reference to: -
    i. A notice issued in accordance with Part 5A of the *Environmental Management and Pollution Control Act* 1994; or
    ii. A previous permit; or
b. Ought reasonably to have known was used for a potentially contaminating activity.

A list of potentially contaminating activities is provided within the planning scheme within Table E2.2.

The requirement for assessment was triggered by:

---

[2] Sensitive means a residential use or a use involving the presence of people for extended periods except in the course of their employment, such as in a caravan park, childcare centre, dwelling, hospital or school. *Hobart Interim Planning Scheme 2015 - Administration*

- The proposed area of excavation is estimated to be approximately 189m^2 for the construction of a new kiosk building (area of disturbance shown on attached Figures 1 and 2).
- The identification by HCC of the following potentially contaminating activities occurring on the neighboring site, located at 373 Argyle Street, North Hobart. A copy of correspondence with Hobart City Council is included within Appendix B.
    - Brick manufacture – the property was once known as 'Brickfield' and operated as a brick kiln from 1816 until approximately 1850[3].
        - The use of kilns on the Brickfield site to fire bricks satisfies the requirements of defining the site as potentially contaminated land under the PCLC.
        - Records recovered, and included within Appendix B, from the National Library of Australia (TROVE)[4] have confirmed the location of the 'Brickfield' site. Maps dating from 1836 and 1849 indicate that both 393 Argyle Street and the Site are situated within the area identified as Brickfields.
        - Based on the recovered maps, it appears as though the Brickfields property extended from Argyle to Letitia street (west to east) and present day Wignall and Lewis Streets (south to north), meaning that the potentially contaminating activity identified by HCC not only occurred on 393 Argyle Street, but also the Site (1-5 Ryde Street).
    - Landfilling operations – the property was used as a landfill for an unspecified duration.[5]
        - The use of a site as a landfill satisfies the requirements of defining the site as potentially contaminated under the PCLC.
    - Dangerous goods registration forms received from the Department of Justice are included within Appendix B. The records indicate that dangerous goods were kept at the site, however the dangerous goods appear to have been restricted to bottled liquified petroleum gas, and therefore do not pose a significant risk of contamination to the site.
    - Records (included within Appendix B) received from the Tasmanian Environmental Protection Authority (EPA) have identified that they have no records relating to contamination or potentially contaminating activities being carried out on the site. The Property Information Request (PIR) carried out by the Tasmanian EPA identified:
        - Several underground storage tanks (USTs) have been registered within a 150m radius of the site. These tanks are located at:
            - 27-29 Federal Street (1963-1985)

[3] See email correspondence with HCC within Appendix B. Years of operation was communicated to EM&C over the phone following the emailed response.

[4] Maps provided within Appendix B.

[5] See correspondence with HCC contained within Appendix B.

- 31 Federal Street (1972-1986)
- 37-41 Federal Street (1986)
- 49a-53 Federal Street (1974-1977)
- 396 Argyle Street, Units 1 & 2 (1972-1984)

▪ None of these sites share a property boundary with 1-5 Ryde Street, and therefore do not trigger the provisions of the PCLC, however, EM&C consider the property located at 396 Argyle Street may have potentially contributed to onsite contamination (if found) due to its position up topographical, and potentially hydrological gradient of the investigation area.

4. ASSESSMENT FRAMEWORK

The assessment work scope and sampling and quality analysis plan was developed in accordance with *The National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (2013 Amendment)*. This NEPM document has been adopted by the Tasmanian government as State Policy and can reasonably be referenced as the standard(s) of the EPA.

5. SITE DESCRIPTION/SETTING

5.1. Site Identification Information

Table 5.1 Site Identification Information

Site Address	1-5 Ryde Street, North Hobart, Tasmania 7000
Certificate of Title (CoT)	119922/1 Ref: www.thelist.tas.gov.au (30 August, 2018)
Property Identification Number (PID)	2003969 Ref: www.thelist.tas.gov.au (30 August, 2018)
Approximate Location of Area Under Assessment	The approximated location of the site centroid is: E: 525834 N: 5253822 (GDA 94 MGA55) Ref: www.thelist.tas.gov.au (30 August, 2018)

5.2. Land Use

Table 5.2.1 Site Land Use Information

Current Land Use	The property as a whole has a current 'recreational/public open space' land use however the specific investigation area would be classified as a commercial/industrial land use based on the definitions provided within Schedule B7 of the NEPM. The site contains a large grassed sports field surrounded by asphalt and concrete standing room viewing areas. There are multiple grandstands onsite. The investigation area sits within an area currently covered by asphalt and the current kiosk building.
Current Site Zoning	The site is zoned '18.0 Recreation' under the Hobart Interim Planning Scheme, 2015.
Surrounding Land Uses	• The property to the north, 393 Argyle street is operated as a hotel, with multi-level accommodation including ground floor apartments • To the west across Argyle street, to the south across Ryde Street and to the east across Letitia Street lie low density residential dwellings.
Site Area	The area of the site is approximately 35,070m² based on measurements provided within the Smeekes Drafting Plan NHO_K 001 (Appendix A)

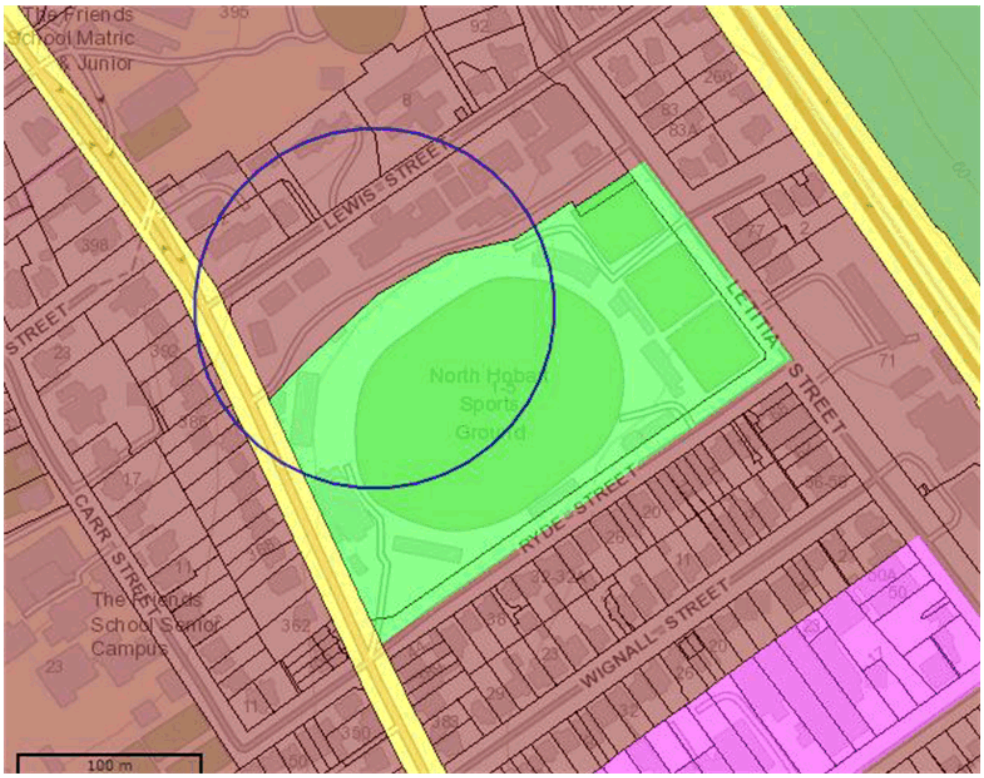

Figure 5.2. Local Area Land Zoning: The blue circle shows the area within a 100m radius of the approximate investigation area within the Site. Source: www.thelist.tas.gov.au. (August 2018). An explanation of the shading is provided within Table 5.2.2 below.

Table 5.2.2 Land Zoning Legend

Zoning Fill	Zoning ID	Zoning Description
	11.0	Inner Residential (Hobart Interim Planning Scheme 2015)
	18.0	Recreation (Hobart Interim Planning Scheme 2015)
	24.0	Light Industrial (Hobart Interim Planning Scheme 2015)
	28.0	Utilities (Hobart Interim Planning Scheme 2015)
	19.0	Open Space (Hobart Interim Planning Scheme 2015)

5.3. Topography & Hydrology

Mapped regional topography is shown below in Figure 5.3 and shows the general topography in the area falls to the south east towards the Hobart CBD. The elevation of the investigation area within the site is approximately 52mAHD, based on the survey contours provided within the Smeekes Drafting Plan NHO_K 003 (Appendix A). This value appears to be consistent with the topographic contours available from TheList (provided in Figure 5.3 below).

The nearest year-round surface water body down hydraulic gradient of the site is Hobart Rivulet, situated approximately 1.8km to the southwest of the site.

At this location, the rivulet would likely be classified as a marine ecosystem, as it is likely sitting within the tidal influence of the Derwent Estuary, located approximately 600m further downstream.

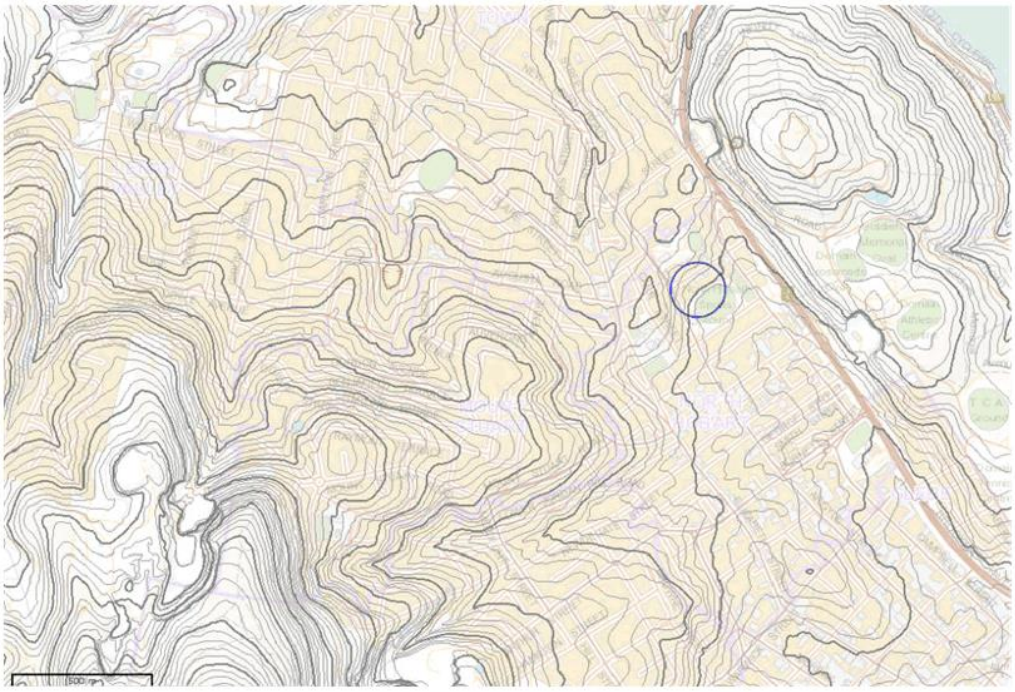

Figure 5.3. Local Area Topography: The blue circle shows the area within a 100m radius of the approximate investigation area within the Site. Source: www.thelist.tas.gov.au. (August 2018).

5.4. Geology

The site is situated in a shallow valley in between Jurassic aged dolerite outcrops to the northeast (The Glebe and Queens Domain) and the southwest (Knocklofty). The site is surrounded predominantly by Triassic aged sand and silt stones with mapped interbedded yellow brown or grey carbonaceous siltstone, mudstone and thin to thick-bedded quartz-rich lithic arkosic sandstone, below the investigation area.

Quaternary sediments lie to the southeast of the Site, following the low point of the valley further towards the southeast, following the path of where the Brooker Highway now lies towards the Wapping confluence with the Hobart Rivulet.

The following mapped geologies are present, and depicted within Figure 5.4 below (source: www.thelist.tas.gov.au accessed August 2018).

- **Q:** Undifferentiated Quaternary sediments.
- **Qa:** Alluvial gravel, sand and clay.
- **Qhmm:** Man made deposits
- **Tcbd:** Poorly sorted boulder to pebble grade deposits with boulders up to 3 m length, clasts generally dominantly of dolerite with traces to rarely dominant amounts of Upper Parmeener mudstone and other rocks and less commonly Lower Parmeener rocks.
- **Jd:** Dolerite and related rocks
- **R:** Undifferentiated Triassic fluviolacustrine sequences of sandstone, siltstone and mudstone.
- **Rv:** Undifferentiated volcaniclastic, quartz-rich lithic and quartzose sandstone, siltstone, mudstone, carbonaceous beds and coal seams.
- **Rqph:** Freshwater predominantly cross-bedded quartzose to feldspathic sandstone commonly with overturned cross-bedding, subordinate siltstone with sparse plant and vertebrate fossils (Knocklofty Formation).
- **Rvcg:** Thickly- to thinly-bedded volcanic lithic sandstone, siltstone, mudstone and coal seams, fossil plants on some horizons (Newtown Coal Measures).
- **Rvcq:** Interbedded cross-bedded white quartzose sandstone, quartz-rich lithic sandstone, siltstone and mudstone; Hobart area- upper interval with much dark grey carbonaceous mudstone, thin lenticular coal seams and fossil plants in places
- **Rvvf:** interbedded yellow brown or grey carbonaceous siltstone, mudstone and thin to thick-bedded quartz-rich lithic arkosic sandstone

Figure 5.4 Local Area Geology, Source: www.thelist.tas.gov.au (August 2018)

The site's shallow geology/soil horizons were encountered and logged as follows:

0.0 to 0.18mBGS	Asphalt
0.18 to 0.3mBGS	Fine Crushed Rock Fill, logged as medium sandy, very coarse SAND with medium gravel
0.3 to 0.6mBGS	Silty medium SAND with clay.
0.6 to 1.4mBGS	Very coarse sandy coarse SAND with fine gravel.

At a depth of 0.5-0.7mBGS within SB2, the soil profile appeared to be comprised of light friable charcoal fragments within a matrix of ash.

5.5. Hydrogeology

EM&C completed a search of Water Resources Tasmania's (WRT) Groundwater Information Access Portal (GIAP) in August 2018. This search identified no local groundwater bores within 500m of the site. A screenshot of the search is provided within Appendix F (Ref: wrt.tas.gov.au, 2018).

6. SAMPLING AND ANALYSIS QUALITY PLAN

This Sampling and Analysis Quality Plan (SAQP) aims to provide sufficient supporting data to determine the contamination and waste categorisation status of the site and excavated material, relative to the nominated assessment criteria. It also aims to present all data with an acceptable level of confidence. The project SAQP is summarised in the table below. The location PESA sample locations are shown on attached Figure 2, Sample Location Plan.

Table 6.0 Sampling and Analysis Quality Plan Summary

Objective of assessment	To assess the area identified for excavation/ground disturbance works for evidence of soil contamination, which may determine if the development will adversely impact on human health or the environment. Should such a finding be found, identify any specific remediation and/or protections measures required to be implemented before excavation commences. If offsite disposal of soil is required, classify the soil within the definitions provided within the Tasmanian EPA publication *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal*.
Quality Control samples to be collected	For soil media: • 1 duplicate per 20 samples provided to laboratory. • 1 equipment rinsate per 20 samples. • 1 laboratory prepared trip blank per day sampling. For Soil Vapour: • 1 duplicate per 20 samples provided to laboratory.
Media to be sampled	Soil and sub surface soil vapour.
Analytes to be tested for primary samples	**Soil:** Total hydrocarbons, reported as TRH and TPH fractions, benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), Tasmanian IB105 regulatory suite (metals, cyanide, PCBs, OC pesticides, phenols and PAHs). **Soil Vapour:** NEPM Suite: Total Recoverable Hydrocarbon (F1&F2 Fractions), BTEXN + Vinyl Chloride, PCE, TCE, TCA, cis-1,2- Dichloroethene.
Number of samples	**Soil:** Five soil bores (SB1 – SB5) to be completed with laboratory analysis of 11 discrete soil samples. Sample density chosen to allow for in-situ soil classification for disposal at a density of > 1/25m³) within shallow profile, along with sufficient samples of the soil which will be retained onsite, below the planned excavation extent of 51.49mAHD. Each soil bore to be screened for Volatile Organic Compounds ('VOC') as a minimum of every third of a meter. **Soil Vapour:** Soil vapour sampled using an installed soil vapour implant SV1_0.8-1.0
Sampling methods	**Soil:** Samples for analysis to be taken from a clean decontaminated hand auger (rinsate blanks to confirm decontamination process). Where other methods of sampling are employed to obtain a sample, the method of collection should be clearly noted along with the sample results. **Soil Vapour:** Sample for analysis to be collected in new, sterile tedlar bags.

Field Screening	**Soil:** Screening for VOCs at a minimum of each metre using a photo ionisation detector (PID). **Soil Vapour:** Screening for commonly encountered soil gases during the purging of soil vapour sample point prior to sample collection. Gases to be screened for include methane, carbon dioxide, oxygen, methane LEL, and VOCs.
Laboratory to be used	**NATA accredited laboratory:** ALS Environmental
Relevant Risk Assessment Criteria	Environmental Management and Pollution Control Act 1994 (EMPCA) The National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPM). The NEPM is state policy in Tasmania for the assessment of site contamination. *CRC Care (2011),* Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater. Technical Report No. 10, Part 2: Application Document. CRC Care (2013), Petroleum hydrocarbon vapour intrusion assessment: Australian guidance, Technical Report No.23, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia. Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, November 2012.

7. ASSESSMENT CRITERIA

The adopted environmental assessment criteria are detailed in Table 7.0 below.

Table 7.0 Adopted Site Assessment Soil and Soil Vapour (where relevant) Investigation Levels

	Criteria	Land Use Scenario	Relevant for Assessment	Application
ALL SOIL & SOIL VAPOUR	**Health Based Investigation Levels**			
	Health Investigation Levels	HIL A	No	Not applicable: No residential land use
		HIL B	No	
		HIL C	No	Site would broadly be construed as public open space, however the land use setting for a commercial/Industrial receptor is more appropriate due to the potential exposure scenario.
		HIL D	Yes	Assessment locations have been selected to lie below the planned Kiosk building. Occupiers of this space can broadly be defined as commercial/industrial receptors
	Health Screening Levels for Vapour Intrusion	HSL A & HSL B	No	Not applicable: as above
		HSL C	No	
		HSL D	Yes	Assessment locations have been selected to lie below the planned Kiosk building. Occupiers of this space can broadly be defined as commercial/industrial receptors
		IMW	Yes	It has been identified that intrusive maintenance works could foreseeably occur at the site within the investigation area. This screening level will also be appropriate for assessing the risk posed to construction workers during the proposed development excavation.
	Health Screening Levels for Direct Contact	HSL A	No	Not applicable: As above. No soil within the investigation area will remain unsealed following construction.
		HSL B	No	
		HSL C	No	
		HSL D	No	
		IMW	Yes	It has been identified that intrusive maintenance works could foreseeably occur at the site within the investigation area. This screening level will also be appropriate for assessing the risk posed to construction workers during the proposed development excavation.
	Ecology Based Investigation Levels			
	Ecological Investigation and Screening Levels	Areas of ecological significance	No	Not applicable. No identified ecological receptor within assessment area.
		Urban residential and public open space	No	
		Commercial and industrial	No	
	Management Limits and Aesthetic Investigation Levels			
	Soil Management Limits for Petroleum Hydrocarbons	Residential, parkland and public open space	No	Not applicable.
		Commercial and industrial	Yes	Considered due to on-going commercial use.
	Aesthetic Considerations	All	No	Not applicable.
SOIL ABOVE 51.5mAHD	**Tasmanian Waste Guidelines Classification and Management of Contaminated Soil for Disposal**			
	Controlled Waste Disposal Criteria	-	Yes	In-situ soil currently situated above 51.49mAHD has been identified for removal within Drawing NHO_K 003. To determine the suitability for offsite disposal and to categorise the waste, the soil should be assessed against the Controlled Waste Disposal Criteria.

8. ESA WORKSCOPE

The following work scope was completed to meet the assessment objective.

8.1.1. Soil Assessment

Mobilisation of two EM&C Environmental Consultants to site on 7 and 10 September 2018 to drill five soil bores, designated SB1 to SB5. All drilling locations are shown on attached Figure 2. The completed work scope comprised of:

- Logging of soil profile during and the field screening of soil samples collected from each completed soil bore at regular depth intervals and changes in soil type for the presence of VOCs using a photo ionisation detector (PID).
- The collection and laboratory analysis of eleven primary soil samples:
    - Screening and collection of samples at changes in soil type, areas of visible staining and diverse relative depths.
    - Of the eleven soil samples collected, six primary samples were taken from soil located above 51.49mAHD (which is proposed to be excavated), with the remaining five primary samples taken below this depth, intending to be reflective of in-situ conditions following the proposed development.
    - In order to identify hot spots, samples destined for analysis were selected based on where the level of contamination was expected to be the most significant.
    - The collection and laboratory analysis of the following field QA/QC sample:
        - One blind duplicate sample designated QCP_7/9/18, a duplicate of SB1_0.2-0.3.
    - Collection of samples into sterile glass jars and placement of these jars into a chilled and insulated esky.
    - Transportation of samples to a NATA-accredited laboratory for analysis of the schedule listed within the Sampling and Analysis Quality Plan (Section 6 above).
- The collection and analysis of additional QA/QA samples, an equipment rinsate blank and a trip blank soil sample.

8.1.2. Sub Slab Soil Vapour Assessment

During the soil assessment stage conducted on 10 September 2018, one soil vapour sample point was installed to a depth of 0.8-1.0 meter below current ground surface. The sample point will reflect soil vapour conditions at 51.2-51.4mAHD, which will be located 0.09-0.29m below the proposed finished ground level. Sample locations are provided on attached Figure 2. The completed installation and sampling program comprised:

- Installation of one soil vapour sample point
- The purging and field monitoring of the composition of the soil gas profile including the recording of the concentration of the following compounds:
  - Methane;
  - Oxygen;
  - Carbon dioxide;
  - LEL% (methane); and
  - Volatile organic compounds.
- The collection and laboratory analysis of soil vapour from the previously installed sample point (SV1_0.8-1.0).
  - Collection of soil vapour sample using a graduated syringe and storage of sample within a new/sterile tedlar bag.
  - The collection and laboratory analysis of the following field QA/QC sample:
    - One blind duplicate sample designated QCP_11/9/18.
      - Upon receipt of the sample QCP_11/9/18, the laboratory reported to EM&C that the tedlar bag had leaked during transit, making analysis not possible.
  - Transportation of samples to a NATA-accredited laboratory for analysis of the schedule listed within the Sampling and Analysis Quality Plan (Section 6 above).

9. RESULTS

The following section presents field observations, measurements and laboratory results. Laboratory results have been presented relative to:

- NEPM Tier 1 assessment criteria for identified potential receptors at the site.
- *Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, November 2012* criteria for potential offsite disposal categorisation.

'Sand' has been selected conservatively as the soil texture group[6] most representative of the site's confining geology. Assessment drill logs are included within Appendix E.

Due to the proposed development involving the excavation of soil, EM&C have adjusted the sample depth for assessment purposes to reflect the post development sample depth when assessing against screening criteria.

9.1. Soil Field Observations

No detectable concentrations of VOCs were detected through the screening of collected soil samples using a PID.

9.2. Soil Analytical Results v Commercial Land Use Criteria

Summarised soil sample results assessing Contaminants of Potential Concern (COPC) are presented below and in attached Table 1. Laboratory certificates of analysis are included within Appendix C.

- No exceedance of the NEPM Health Investigation Levels for a 'commercial/industrial' land use (HIL D).
- No exceedance of the NEPM Health Screening Levels (HSLs) for a 'commercial/industrial' land use (HSL D).
- No exceedance of CRC CARE intrusive maintenance worker (IMW) HSLs for either direct contact or vapour intrusion were found.
- No exceedance of the NEPM Soil Management Limits for 'commercial and industrial' land use.

[6] Reference to soil texture groups as defined by United States Department of Agriculture (USDA)

9.3. Soil Analytical Results v TAS Soil Disposal Guidelines (IB105)

Summarised soil sample results of samples situated above the extent of the proposed excavation cutting, assessing COPCs against the Tasmanian Soil Disposal Guidelines[7] is provided within attached Table 2. A laboratory prepared comparative analytical report of the same samples is included within Appendix C.

- The following samples exceeded the maximum allowable total concentration for Low Level Contaminated Soil/Level 2 for benzo(a)pyrene (2.0mg/kg)
    - SB1_0.2-0.3 (3.0mg/kg)
    - SB2_0.2-0.3 (2.2mg/kg)
    - SB5_0.3-0.4 (2.7mg/kg)

Based on the above exceedances of Level 2 criteria, under the Tasmanian Soil Disposal Guidelines[8] the soil identified for excavation and disposal can be classified as Contaminated Soil/Level 3.

9.4. Soil Vapour Results

Summarised soil vapour sample results assessing Contaminants of Potential Concern (COPC) are presented below and in attached Table 3. Laboratory certificates of analysis are included within Appendix C.

- No exceedance of the NEPM Health Screening Levels (HSLs) for a 'commercial/industrial' land use (HSL D) were identified.
- No exceedance of CRC CARE intrusive maintenance worker (IMW) HSLs vapour intrusion were found.

9.5. QA/QC Results

Field QA/QC analytical results are presented in attached Tables 4a and 4b. Copies of the NATA endorsed laboratory reports, including internal QA/QC results and chain-of-custody documentation for the primary laboratory are included within Appendix C.

The findings of the projects precision, accuracy, representativeness, comparability and completeness data quality indicators (DQIs) are summarised within this section. In addition a DQI checklist has been attached in Appendix D. Additionally, CRC CARE Checklists L and K are included within Appendix G.

9.5.1. Comparability

- An appropriately experienced person - in accordance with EM&C's Assessment Procedure detailed within the SAQP outlined in Section 6, collected all samples.
- The laboratory used was NATA-accredited for the requested analytes and provided documented methods of analysis.

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[7] Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (v3 2018)

[8] Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (v3 2018)

9.5.2. Precision

Assessment of quality control data revealed:

- Soil field duplicates reported COPC concentrations within the assessment relative percentage difference (RPD) criteria[9] for all duplicate samples taken.
- The soil vapour field duplicate of SV1_0.8-1.0 leaked during transit to the laboratory, and therefore was not analysed.
- Non-conformity was observed within the following laboratory standards, calibration blanks and verifications. Internal Quality Control (QCI) reports are supplied within Appendix C

9.5.3. Accuracy

All field equipment was calibrated prior to use. See calibration certificates provided within Appendix E.

9.5.4. Representativeness

- All media identified in the project's SAQP in Section 6 have been sampled.
- All samples were put into containers provided by a NATA-accredited laboratory, stored in a chilled esky (soil) and transported to each laboratory within holding times. See Appendix C for laboratory sample receipt notices.
- Target analytes were not detected in trip blank or equipment rinsate blank samples.
- No inconsistencies were identified within the method of sample collection.
- No inconsistencies have been identified in laboratory methods.

9.5.5. Completeness

- All samples locations have been sampled in accordance with the SAQP.
- All samples were sent to each laboratory within technical holding times and with accurately completed documentation.
- EM&C considers the collected dataset sufficiently complete to be relied upon to support the assessments data quality objectives.

[9] Which is calculated based on the primary result, relative to the primary laboratory LOR

10. CONCLUSIONS

At the completion of the Preliminary Environmental Site Assessment (PESA), undertaken to make an assessment of the proposed development, and subject to the assessment scope and statement of limitations (Section 11), EM&C conclude that:

- The assessed level of site contamination does **not** pose an unacceptable level of risk to workers involved in redevelopment of the site, or to future users of the site, as a result of proposed excavation.
- The assessed level of site contamination does **not** pose an unacceptable level of risk to the environment from the proposed excavation, due to an absence of ecological receptors within the assessment area.
- Assessment of the material identified for excavation above 51.49mAHD has found:
    - The material is suitable for onsite reuse within the area proposed for 'fill' within drawing number NHO_K 003, which is to be a covered terrace area, and contained within a blockwork retaining wall (Appendix A). This area is also identified within attached Figure 2 as a purple shaded area.
        - This conclusion is made on the basis that ecological screening levels are not applicable, due to the absence of ecological receptors within this area.
    - The material is unsuitable for reuse anywhere onsite where ecological screening levels apply, which are unsealed areas at a depth of less than 2 meters below ground surface, which is representative of root and habitation zones of many flora and fauna species. Examples of such areas unsuitable for reuse of excavated material includes (but is not limited to):
        - Grassed areas;
        - Garden beds; and
        - Other unsealed areas
    - The concentration of benzo(a)pyrene within the soil would presently see this material classified as Contaminated Soil/Level 3 under the Tasmanian waste classification guidelines IB105 if removed from the site.
    - Should the excavated material be removed from site, the soil is to be handled in accordance with Tasmanian Soil Disposal Guidelines[10].

EM&C recommend the following remediation/protection measures are implemented before excavation commences:

- A construction and environmental management plan should be prepared to ensure the excavated soil and associated contaminants do not spread to areas where ecological screening levels are applicable.

[10] Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (v3 2018)

With reference to the Potentially Contaminated Land Code of the Hobart Interim Planning Scheme 2015, clause E2.6.2 Excavation (b), the completed preliminary environmental site assessment has established, based on the plans provided:

- The planned 'excavation **does not adversely impact on human health or the environment**'; and
- '**specific remediation and protection measures**' are required to be implemented before excavation commences'

The report conclusions are made against both the existing and proposed future land use, as identified within the drafting plans (Appendix A). Further assessment may be required if a change to a more sensitive land use is proposed or the environmental condition of other areas of the site need to be assessed.

11. STATEMENT OF LIMITATIONS

This report has been prepared in accordance with the scope of services described in the contract or agreement between Environmental Management & Consulting Pty Ltd (EM&C) and the Client. The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client. Furthermore, the report has been prepared solely for use by the Client and EM&C accepts no responsibility for its use by other parties. The client agrees that EM&C's report or associated correspondence will not be used or reproduced in full or in part for promotional purposes and cannot be used or relied upon in any prospectus or offering.

No warranties express or implied are made. Subject to the Scope of Work, EM&Cs assessment is limited strictly to identifying typical environmental conditions associated with the subject property and does not include evaluation of the structural conditions of any buildings on the subject property or any other issues. Additionally unless otherwise stated EM&C did not conduct soil, air, wastewater or other matrix analyses including asbestos or perform contaminated sampling of any kind. Nor did EM&C investigate any waste material from the property that may have been disposed of off the site, nor related waste management practices.

The results of this assessment are based upon site inspection conducted by EM&C personnel, information from interviews with people who have knowledge of site conditions and information provided by regulatory agencies. All conclusions and recommendations regarding the property are the professional opinions of the EM&C personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability have been made, EM&C assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of EM&C, or developments resulting from situations outside the scope of this project.

EM&C is not engaged in environmental auditing and /or reporting of any kind for the purpose of advertising sales promoting, or endorsement of any clients' interests, including raising investment capital, recommending investment decisions, or other publicity purposes. EM&C assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of EM&C, or developments resulting from situations outside the scope of this project.

Information relating to soil, groundwater, waste, air or other matrix conditions in this document is considered to be accurate at the date of issue. Surface, subsurface and atmospheric conditions can vary across a particular site or region, which cannot be wholly defined by investigation. As a result, it is unlikely that the results and estimations presented in this report will represent the extremes of conditions within the site that may exist. Subsurface conditions including contaminant concentrations can change in a limited period of time and typically have a high level of spatial heterogeneity.

From a technical perspective, there is a high degree of uncertainty associated with the assessment of subsurface, aquatic and atmospheric environments. They are prone to be heterogeneous, complex environments, in which small subsurface features or changes in geologic conditions or other environmental anomalies can have substantial impact on water, air and chemical movement.

Major uncertainties can also occur with source characterization assessment of chemical fate and transport in the environment, assessment of exposure risks and health effects, and remedial action performance. These factors make uncertainty an inherent feature of potentially impacted sites. Technical uncertainties are characteristically several orders of magnitude greater at impacted sites than for other kinds of projects.

EM&C's professional opinions are based upon its professional judgment, experience, and training. These opinions are also based upon data derived from the limited testing and analysis described in this report. It is possible that additional testing and analysis might produce different results and/or different opinions or other opinions. EM&C has limited its investigation(s) to the scope agreed upon with its client. EM&C believes that its opinions are reasonably supported by the testing and analysis that has been undertaken (if any), and that those opinions have been developed according to the professional standard of care for the environmental consulting profession in this area at this time. Other opinions and interpretations may be possible. That standard of care may change and new methods and practices of exploration, testing and analysis may develop in the future, which might produce different results.

EM&C is not in the business of providing legal advice.

12. REFERENCES

Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand (2000) [Referenced as ANZECC 2000], Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1.

CRC Care (2011), Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, Technical Report No. 10, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.

CRC Care (2013), Petroleum hydrocarbon vapour intrusion assessment: Australian guidance, Technical Report No.23, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.

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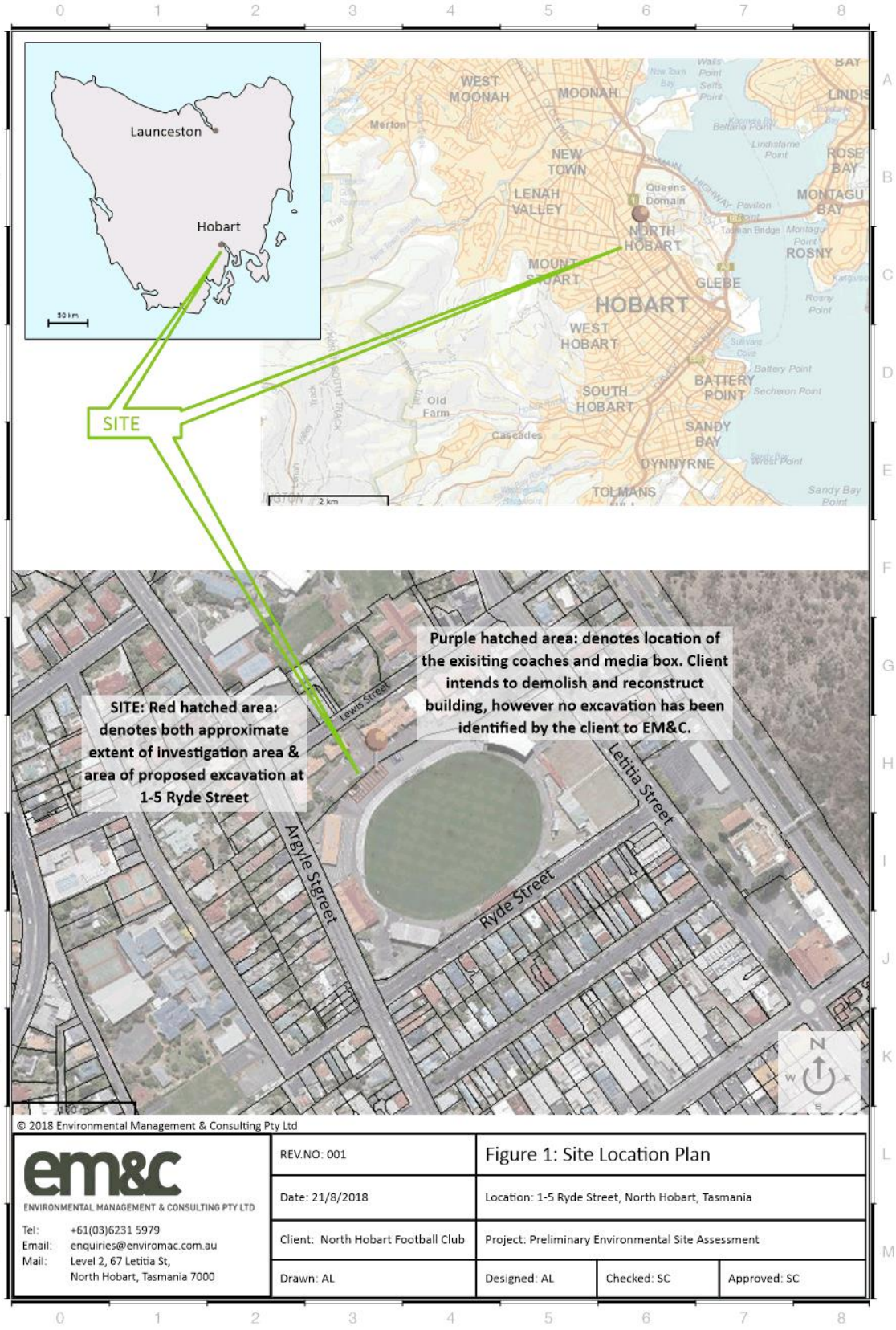
Tasmanian Environmental Protection Authority, 2018, Information Bulletin 105 (IB105), Classification and Management of Contaminated Soil for Disposal, Version 3.

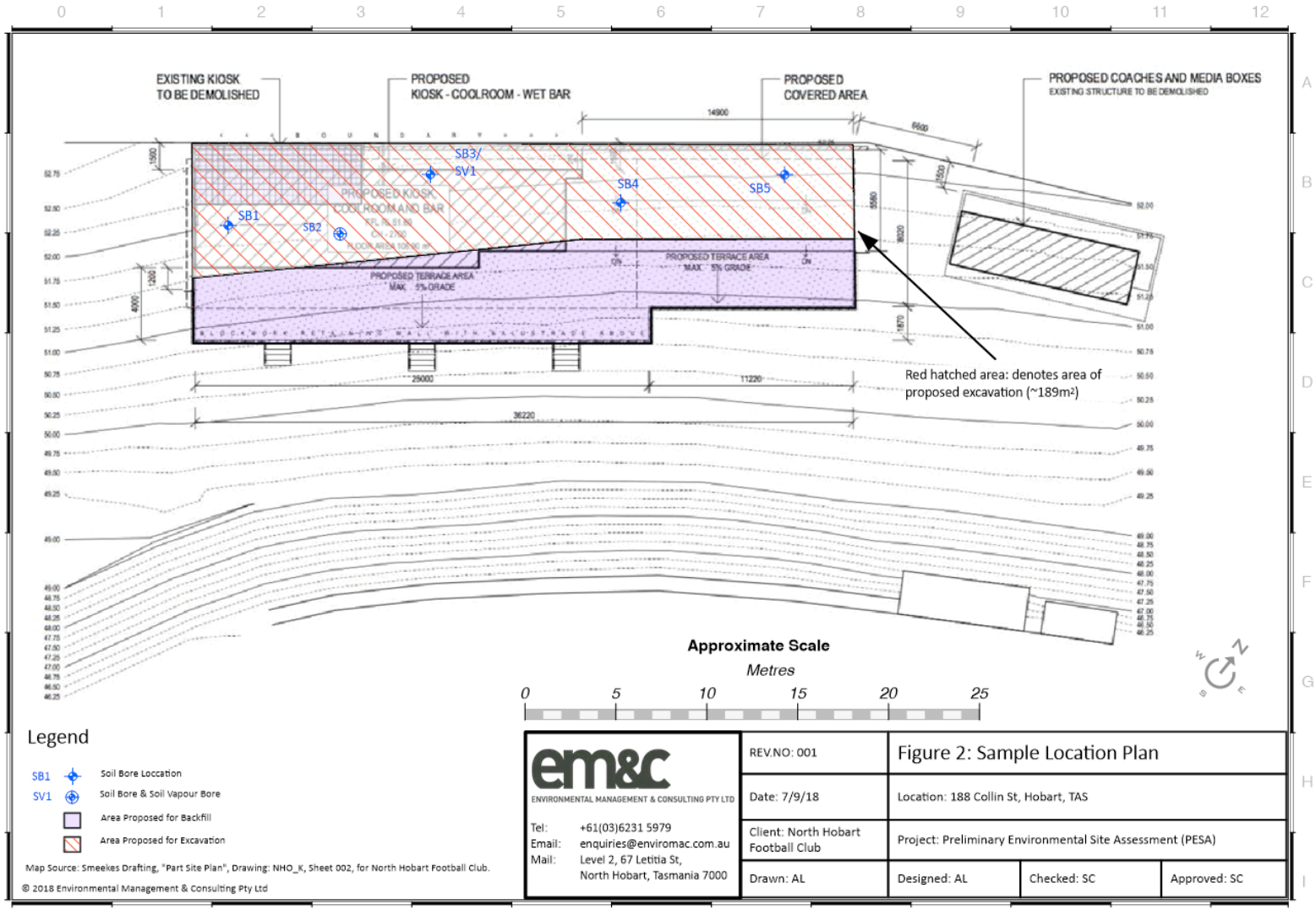
The LIST, 2018, www.thelist.tas.gov.au, Land Information System Tasmania, accessed by EM&C in September 2018

FIGURES



em&C
ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD
Tel: +61(03)6231 5979
Email: enquiries@enviromac.com.au
Mail: Level 2, 67 Letitia St,
North Hobart, Tasmania 7000

REV.NO: 001	Figure 1: Site Location Plan		
Date: 21/8/2018	Location: 1-5 Ryde Street, North Hobart, Tasmania		
Client: North Hobart Football Club	Project: Preliminary Environmental Site Assessment		
Drawn: AL	Designed: AL	Checked: SC	Approved: SC


EXISTING KIOSK TO BE DEMOLISHED
PROPOSED KIOSK - COOLROOM - WET BAR
PROPOSED COVERED AREA
PROPOSED COACHES AND MEDIA BOXES
EXISTING STRUCTURE TO BE DEMOLISHED
SB1
SB2
SB3/ SV1
SB4
SB5
PROPOSED TERRACE AREA MAX. 5% GRADE
Red hatched area: denotes area of proposed excavation (~189m²)
Approximate Scale
Metres
0 5 10 15 20 25
Legend
SB1 Soil Bore Loccation
SV1 Soil Bore & Soil Vapour Bore
Area Proposed for Backfill
Area Proposed for Excavation
Map Source: Smeekes Drafting, "Part Site Plan", Drawing: NHO_K, Sheet 002, for North Hobart Football Club.
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ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD
Tel: +61(03)6231 5979
Email: enquiries@enviromac.com.au
Mail: Level 2, 67 Letitia St, North Hobart, Tasmania 7000
REV.NO: 001
Figure 2: Sample Location Plan
Date: 7/9/18
Location: 188 Collin St, Hobart, TAS
Client: North Hobart Football Club
Project: Preliminary Environmental Site Assessment (PESA)
Drawn: AL
Designed: AL
Checked: SC
Approved: SC

TABLES

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Table 1
In-Situ Soil Validation Analytical Results v Land Use Criteria
Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene, Polycyclic Aromatic Hydrocarbons and Lead

Sample ID_Depth *(m)*	Sample Date	Sample Location Ground Surface RL[6]	Post Development sample depth (mBGS)	PID Results *(ppm)*	Soil Moisture Content	Land Use	Confining Geology (USDA Soil Texture Group)[7]	Total Recoverable Hydrocarbons *(mg/kg)*						Benzene *(mg/kg)*	Toluene *(mg/kg)*	Ethyl-benzene *(mg/kg)*	Xylenes *(mg/kg)*	Naph-thalene[4] *(mg/kg)*	Polycyclic Aromatic Hydrocarbons *(mg/kg)*			Carcino-genic PAHs as BaP TEQ[5] *(mg/kg)*	Lead *(mg/kg)*
								C6 - C10	F1 *C6 - C10 less BTEX*	>C10 - C16	F2 *>C10 - C16 less Naphthalene*	F3 *>C16 - C34*	F4 *>C34 - C40*						Naph-thalene[4]	Benzo(a)-pyrene	Total PAHs		
In-Situ Excavation Soil Assessment 4 September 2018																							
SB1_0.2-0.3	07-Sep-18	52.10	NA - Excavated	0.0	12.5	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	280	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	3.0	27.9	3.8	90
SB1_0.5-0.6	07-Sep-18	52.10	NA - Excavated	0.0	16.2	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.1	<0.5	0.6	35
SB1_1.0-1.1	07-Sep-18	52.10	0.40	0.0	13.8	Com. / Ind.	SAND: 0- < 1m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB2_0.2-0.3	07-Sep-18	51.80	NA - Excavated	0.0	13.8	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.2	10.5	1.9	28
SB2_0.5-0.6	07-Sep-18	51.80	0.20	0.0	14.2	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	3.2	0.6	28
SB3_0.4-0.5	10-Sep-18	52.20	NA - Excavated	0.0	8.7	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.6	1.4	0.6	26
SB3_0.9-1.0	10-Sep-18	52.20	0.20	0.0	13.3	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	120	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	29.4	3.0	158
SB4_0.2-0.3	07-Sep-18	51.80	NA - Excavated	0.0	5.8	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.05	<0.5	0.6	<5
SB4_1.3-1.4	07-Sep-18	51.80	1.00	0.0	15.7	Com. / Ind.	SAND: 1- < 2 m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	1.8	0.6	42
SB5_0.3-0.4	07-Sep-18	52.00	NA - Excavated	0.0	10.8	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	140	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.7	24.9	4.0	49
SB5_0.5-0.6	07-Sep-18	52.00	0.00	0.0	12.9	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	4.4	1.1	76
Limit of Reporting Soil								10	10	50	50	100	100	0.2	0.5	0.5	0.5	1.0	0.5	0.5	0.5	-	5
NOMINATED GENERIC INVESTIGATION CRITERIA																							
[1] **NEPM HIL 'D' - Commercial/ Industrial**								-	-	-	-	-	-	-	-	-	-	-	-	-	4000	40	1500
[1] **NEPM Soil HSL 'D' for Vapour Intrusion - Commercial/ Industrial**							SAND: 0- < 1m	-	260	-	NL	-	-	3	NL	NL	230	NL	-	-	-	-	-
[1] **NEPM Soil HSL 'D' for Vapour Intrusion - Commercial/ Industrial**							SAND: 1- < 2 m	-	370	-	NL	-	-	3	NL	NL	NL	NL	-	-	-	-	-
[2] **CRC CARE Soil HSL 'D' for Direct Contact - Commercial/ Industrial**							-	-	26000	-	20000	27000	38000	430	99000	27000	81000	11000	-	-	-	-	-
[2] **CRC CARE Soil HSL 'IMW' for Vapour Intrusion - Intrusive Maintenance Worker**							SAND: 0- < 2 m	-	NL	-	NL	NL	NL	77	NL	NL	NL	NL	-	-	-	-	-
[2] **CRC CARE Soil HSL 'IMW' for Direct contact - Intrusive Maintenance Worker**							-	-	82000	-		85000	120000	1100	120000	85000	130000	29000	-	-	-	-	-
[1] **NEPM Soil Management Limits - Commercial and industrial**							COARSE SOIL	700	-	1000	-	3500	10000	-	-	-	-	-	-	-	-	-	-
[1] **Soil Saturation concentration**							SAND	-	950	-	560	-	-	360	560	64	300	9	9	-	-	-	-

Tables Notes:

1) Assessment criteria are obtained from National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 1999)

2) Assessment criteria are obtained from CRC CARE Technical Report no. 10: Health screening levels for petroleum hydrocarbons in soil and groundwater (Friebel & Nadebaum 2011)

3) ESL criteria have been established for protection of plant root zones and are applicable in non-arid areas for assessment of soil witin the 0- 2mBGS depth range.

4) Laboratory analysis of naphthalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

5) HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P adopted by CCME 2008 (refer Schedule B7). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF and summing these products. TEQs have been calculated using half of the LOR result, where <LOR was reported.

6) Sample point RLs have been estimated based on the ground surface contour plan provided within Drawing NHO_K 003

7) sample depth is based on post development sample depth. For all sames within the zone planned for excavation, EM&C hs conservatively assumed a screening depth of 0-1m with a SAND confining geology

"-" denotes analyte not tested by laboratory, or no criteria available.

Bold values are concentrations reported above laboratory limit of reporting

Highlighted values exceed nominated investigation criteria.

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

HSL: Health Screening Level

HIL: Health Investigation Level

ESL: Environmental Screening Level

EIL: Environmental Investigation Level

IMW: Intrusive Maintenance Worker

PID: Photo-Ionisation Detection

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Table 2
Soil Results
Total Petroleum Hydrocarbons, Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene, Polycyclic Aromatic Hydrocarbons and Lead

Sample ID_Depth *(m)*	Sample Date	PID Results *(ppm)*	Soil Moisture Content	Total Petroleum Hydrocarbons *(mg/kg)*					Benzene *(mg/kg)*	Toluene *(mg/kg)*	Ethyl- benzene *(mg/kg)*	Xylenes *(mg/kg)*	Naph-thalene[2] *(mg/kg)*	Polycyclic Aromatic Hydrocarbons *(mg/kg)*			Lead *(mg/kg)*
				C6 - C9	C10 - C14	C15 - C28	C29 - C36	Total C10 - C36						Naph-thalene[2]	Benzo(a)-pyrene	Total PAHs	
In-Situ Soil Assessment of Soil Situated Above 51.5mAHD - 7 September 2018																	
SB1_0.2-0.3	07-Sep-18	0.0	12.5	<10	<50	**210**	<100	**210**	<0.2	<0.5	<0.5	<0.5	<1	<0.5	3.0	27.9	**90**
SB1_0.5-0.6	07-Sep-18	0.0	16.2	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.1	<0.5	**35**
SB2_0.2-0.3	07-Sep-18	0.0	13.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.2	10.5	**28**
SB3_0.4-0.5	10-Sep-18	0.0	8.7	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.6	1.4	**26**
SB4_0.2-0.3	07-Sep-18	0.0	5.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.05	<0.5	<5
SB5_0.3-0.4	07-Sep-18	0.0	10.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.7	24.9	**49**
Limit of Reporting Soil				10	50	100	100	50	0.2	0.5	0.5	0.5	1.0	0.5	0.5	0.5	5
Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, 2018																	
Fill Material - Level 1				65	-	-	-	1,000	1	1	3	14	-	-	0.08	20	300
Low Level Contaminated Soil - Level 2				650	-	-	-	5,000	5	100	100	180	-	-	2	40	1,200
Contaminated Soil - Level 3				1,000	-	-	-	10,000	50	1,000	1,080	1,800	-	-	20	200	3,000

Tables Notes:

1) Assessment criteria are obtained Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, 2018

2) Laboratory analysis of naphtalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

"-" denotes analyte not tested by laboratory, or no criteria available.

Bold values are concentrations reported above laboratory limit of reporting

Highlighted values exceed nominated investigation criteria.

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

HSL: Health Screening Level

IMW: Intrusive Maintenance Worker

PID: Photo-Ionisation Detection

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Table 3
Soil Vapour Results
NEPM Suite: Total Recoverable Hydrocarbon (F1&F2 Fractions), BTEXN + Vinyl Chloride, PCE, TCE, TCA, cis-1,2- Dichloroethene

Sample ID_Sample Depth (m)	Sample Date	Installed Sample Depth Range	Sample Location Ground Surface RL[3]	Post Development sample depth (mBGS)	Land Use	Confining Geology	TRH (µg/m³)		Benzene (µg/m3)	Toluene (µg/m3)	Ethylbenzene (µg/m3)	Xylenes (µg/m3)	Naph-thalene (µg/m3)	TCE (µg/m3)	1,1,1-TCA (µg/m3)	PCE (µg/m3)	cis-1,2-dichloro-ethene (µg/m3)	Viynl Chloride (µg/m3)	Light HCs and Permanent Gasses Mol (%)			
							F1 C_6 - C_{10} less BTEX	F2 >C_{10}-C_{16} less Naph-thalene											Oxygen	CO_2	Helium	Methane
Soil Vapour Sampling Event - 11/9/18																						
SV1_0.8-1.0	11-Sep-18	0.8-1.0m	52.20	0.1-0.3	Com. / Ind.	SAND: 0 - 1m	<20000	<40000	<100	<190	<220	<650	<100	<5.4	<270	<340	<20	<5.1	**17.7**	**2.81**	<0.01	<0.1
NOMINATED GENERIC INVESTIGATION CRITERIA																						
[1] NEPM Soil Vapour HSL 'D' for Vapour Intrusion						SAND: 0- < 1 m	680000	500 000	4 000	4 800 000	1 300 000	840 000	3 000	80	230000	8000	300	100	-	-	-	-
[2] CRC CARE HSL, Vapour Intrusion, Intrusive Maintenace Worker						SAND: 0- < 2 m	180 000 000	-	760 000	-	-	-	880 000	-	-	-	-	-	-	-	-	-

Table Notes

1) Assessment criteria are obtained from National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 1999)

2) Assessment criteria for an Intrusive Maintenace Worker (IMW) are obtained from CRC CARE Technical Report no. 10: Health screening levels for petroleum hydrocarbons in soil and groundwater (Friebel & Nadebaum 2011)

3) Sample point RLs have been estimated based on the ground surface contour plan provided within Drawing NHO_K 003

"-" denotes analyte not tested by laboratory, or no criteria available. Highlighted values exceed nominated investiga **Bold** values are concentrations reported above laboratory limit of reporting

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

IMW: Intrusive Maintenance Worker

HSL: Health Screening Level

mBGS - metre below ground surface

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Table 4a
Soil Assessment QA/QC Results
Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylenes

Sample ID /Depth *(m)*	Sample Date			Total Recoverable Hydrocarbons *(mg/kg)*				Benzene *(mg/kg)*	Toluene *(mg/kg)*	Ethylbenzene *(mg/kg)*	Xylenes *(mg/kg)*	Naphthalene[1] *(mg/kg)*
				F1 *C6 - C10 less BTEX*	F2 *>C10 - C16 less Naphthalene*	F3 *>C16 - C34*	F4 *>C34 - C40*					
Duplicate Samples (all soil results in mg/kg)												
In-Situ Excavation Validation Soil Assessment												
SB1_0.2-0.3	07-Sep-18			<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
QCP_7/9/18	Primary laboratory	Duplicate of	SB1_0.2-0.3	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
Relative % Difference	SB1_0.2-0.3	and	QCP_7/9/18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RPD criteria				NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT
Pass/Fail				Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Limit of Reporting (LOR) - Soil Samples **(mg/kg)**												
Limit of Reporting ALS (Primary)				10	50	100	100	0.2	0.5	0.5	0.5	1.0
Soil Assessment Trip Blank Samples **(mg/kg)**												
TB_4/9/18	04-Sep-18	Trip Blank		<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
Soil Assessment Equipment Rinsate Blank Samples **(µg/l)**												
RB_4/9/18	04-Sep-18	Rinsate Blank		<20	<100	<100	<100	<1	<2	<2	<2	<5

Tables Notes:

1) Laboratory analysis of naphtalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

"-" denotes analyte not tested by laboratory, or no criteria available.

Bold values are concentrations reported above laboratory limit of reporting.

Highlighted values exceed nominated investigation criteria.

QC- Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable, and have been adopted for this assessment:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

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Table 4b

Soil Vapour Assessment QA/QC Results

Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylenes

Sample ID /Depth *(m)*	Sample Date	Total Recoverable Hydrocarbons *(µg/m3)*		Benzene *(mg/m³)*	Toluene (µg/m³)	Ethylbenzene *(µg/m³)*	Xylenes *(µg/m³)*	Naphthalene[6] *(µg/m³)*	Helium (µg/m³)	Field Measured Helium (µg/m³)
		F1 *C6 - C10 less BTEX*	**F2** *>C10 - C16 less Naphthalene*							
Duplicate (Primary Lab)										
SV1_0.8-1.0	11-Sep-18	<20000	<40000	<100	<190	<220	<650	<100	**<16,000**	
QCP_11/9/18	11-Sep-18 Duplicate of SV1_0.8-1.0	**Sample lost in transit to laboratory (sample bag deflated)**								
Relative % Difference	SV1_0.8-1.0 and QCP_11/9/18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A
RPD criteria		NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	-	NO LIMIT
Pass/Fail		-	-	-	-	-	-	-	-	-
Sample Train Integrity Analysis										
SV1_0.8-1.0	11-Sep-18	-	-	-	-	-	-	-	16000	-
[1] SV1_0.8-1.0 - He Shroud	11-Sep-18	-	-	-	-	-	-	-	*1473128834*	9000000
[2]Sample concentration relative to shroud		-	-	-	-	-	-	-	0.001%	-
[3]CRC CARE TR23 Guidance		-	-	-	-	-	-	-	10%	-
[4]California Environmental Protection Agency - Performance Criteria		-	-	-	-	-	-	-	5%	-
Pass/Fail		-	-	-	-	-	-	-	Pass	-
Limit of Reporting (LOR) - Soil Vapour Samples										
Limit of Reporting ALS		20000	40000	100	190	220	650.0	100.0	16000	-

Tables Notes:

"-" denotes analyte not tested by laboratory, or no criteria available.

1) Helium shroud concentrations are measured via a calibrated handheld helium meter, reporting results in parts per million by volume. The µg/m3 equivilent concentration has been calculated for comparison against the reported concentration of helium within collected soil vapour samples. The formula used for calculation is: µg/m3 = ppmv x atomic mass ÷ 24.45 x 1000

2) Relative concentration is the concentration of helium found within the sample/sample train relative to the concentration found within the shroud during sample collection. Where the analysed concentration of helium was below the LOR, the LOR was used for comparison calculations.

3) CRC CARE provides guidance on the concentration of helium allowable during field leak testing (10% of the shroud concentration) however the document does not provide guidance on the acceptable levels within the collected sample.

4) California EPA Department of Toxic Substances Control provided guidance in July 2015 (https://www.dtsc.ca.gov/SiteCleanup/upload/VI_ActiveSoilGasAdvisory_FINAL.pdf) advising a concentration of up to 5% of the helium concentration used within the shroud is acceptable within the collected sample.

5) QA/QC provided above consist of all QAQC samples taken since prior reporting period

6) Laboratory analysis of naphtalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

"-" denotes analyte not tested by laboratory, or not relevant to QA/QC performance criteria being tested.

Bold values are concentrations reported above laboratory limit of reporting

Italicised values have been calculated based on field reported readings, taken from calibrated field instruments.

Bold values are concentrations reported above laboratory limit of reporting

QC- Acceptance Criteria

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Table 4b

Soil Vapour Assessment QA/QC Results

Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylenes

Sample ID /Depth *(m)*	Sample Date	Total Recoverable Hydrocarbons *(µg/m3)*		Benzene *(mg/m^3)*	Toluene (µg/m^3)	Ethylbenzene *(µg/m^3)*	Xylenes *(µg/m^3)*	Naphthalene[6] *(µg/m^3)*	Helium (µg/m^3)	Field Measured Helium (µg/m^3)
		F1 *C6 - C10 less BTEX*	**F2** *>C10 - C16 less Naphthalene*							

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable, and have been adopted for this assessment:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Table Abbreviations

APPENDIX A

Smeekes Drafting Plans

GENERAL NOTES:

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SMEEKES DRAFTING PTY LTD STANDARD BUILDING NOTES, SHEETS STANDARD-001 TO 008.
2. WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALE.
3. BUILDER TO VERIFY ALL BOUNDARY CLEARANCES AND SITE SET-OUT DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ALL CONSTRUCTION WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND RELEVANT AUSTRALIAN STANDARDS.
5. TIMBER FRAMING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 1684.2 "TIMBER FRAMED CONSTRUCTION". T.P. DECK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLICATION FROM THE TIMBER PROMOTION COUNCIL " TIMBER DECKS - DESIGN AND CONSTRUCTION MANUAL".
6. FOOTINGS AND SLABS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 2870 "RESIDENTIAL SLABS AND FOOTINGS".
7. PLUMBING AND DRAINAGE SHALL BE IN ACCORDANCE WITH AS 3500.2 AND AS 3500.3 "THE NATIONAL PLUMBING AND DRAINAGE CODE". FIT ADJUSTABLE TEMPERING VALVES TO ALL ABLUTIONS IN ACCORDANCE WITH AS 1529 "CODE OF PRACTICE OF HOUSEHOLD TYPE HOT WATER SUPPLY SYSTEMS".
8. WATER PROOFING OF WET AREAS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 3740 "WATERPROOFING OF WET AREAS IN RESIDENTIAL BUILDINGS".
9. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 3000 "WIRING RULES". SMOKE ALARMS SHALL BE INSTALLED IN ACCORDANCE WITH TASMANIAN FIRE SERVICE AND AS 3786 "SMOKE ALARMS".
10. GLAZING SHALL BE IN ACCORDANCE WITH AS 1288 "GLASS IN BUILDINGS - SELECTION AND INSTALLATION", WINDOWS TO COMPLY WITH AS 2047 "WINDOWS IN BUILDINGS - SELECTION AND INSTALLATION".
11. MIN. R6.0 INSULATION TO CEILING. MIN. R2.5 INSULATION TO ALL EXTERNAL WALLS.
12. ALL STEELWORK SHALL BE IN ACCORDANCE WITH AS 4100 "STEEL STRUCTURES".

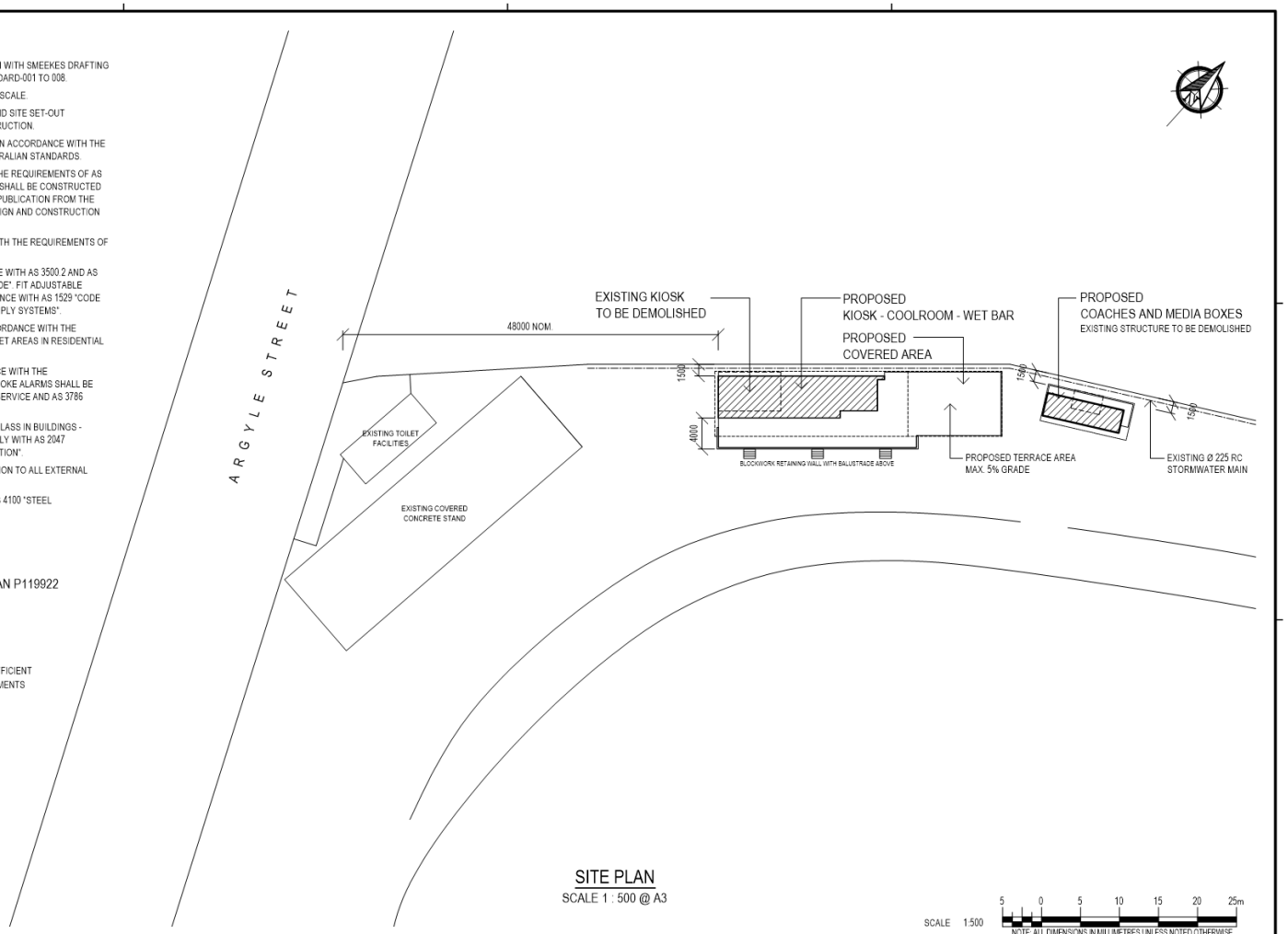
SITE DATA:

LAND TITLE REF. No.	: LOT 1 ON PLAN P119922
CLIMATE ZONE	: ZONE 7
DESIGN WIND SPEED	: 'N3'
SOIL CLASSIFICATION	: 'TBA'
BAL RATING	: BAL-LOW

THE RISK IS CONSIDERED TO BE VERY LOW (THERE IS INSUFFICIENT RISK TO WARRANT ANY SPECIFIC CONSTRUCTION REQUIREMENTS BUT THERE IS STILL SOME RISK.)

SITE COVERAGE:

LOT SIZE	: 35070.00 m²
KIOSK FOOTPRINT	: 106.90 m²



SITE PLAN
SCALE 1 : 500 @ A3

SCALE 1:500 — 5 0 5 10 15 20 25m

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

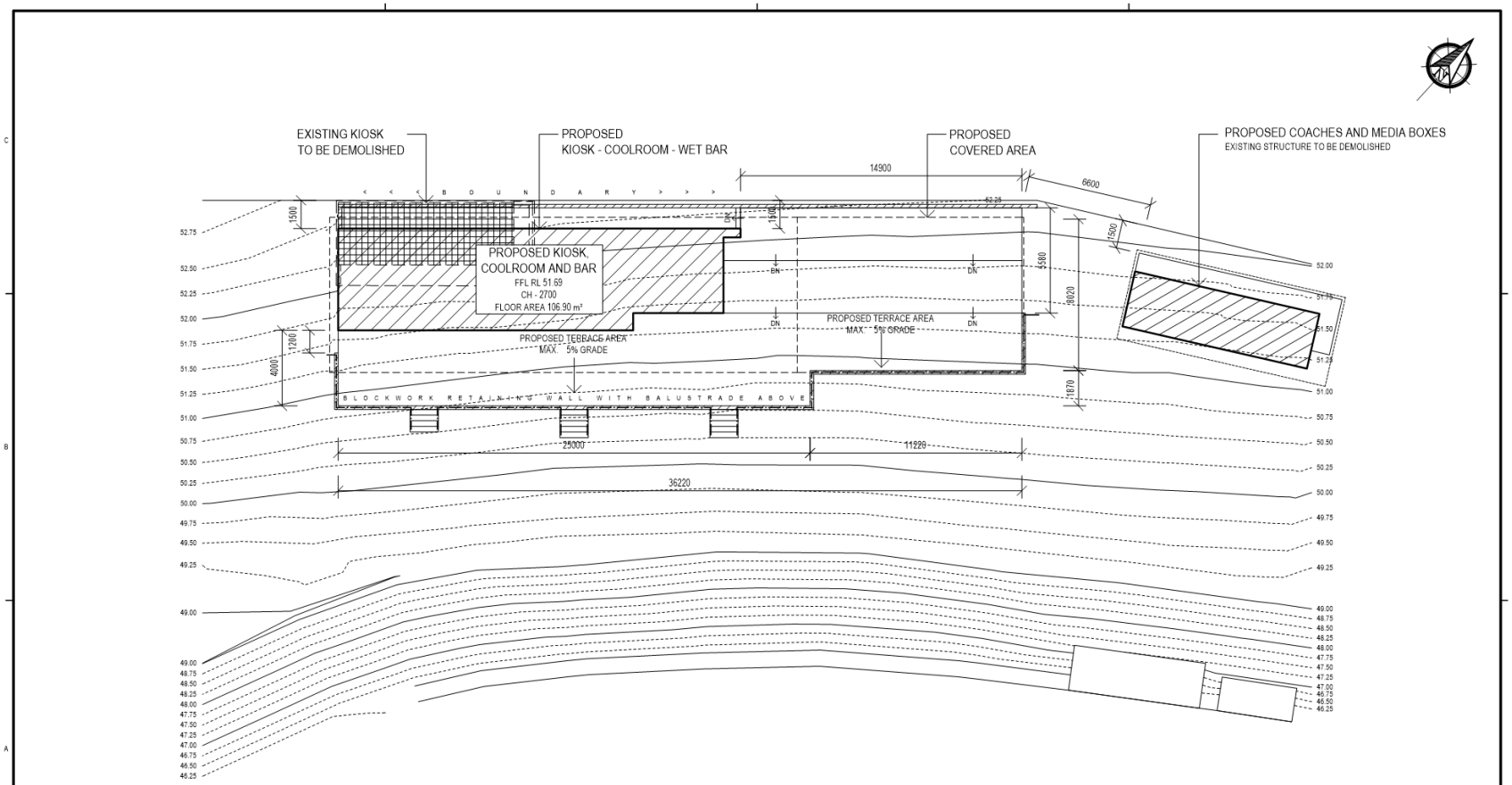
SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

SITE PLAN

ORG No.	SHT.	SCALE	
NHO_K	001	1 : 500	A3



PART SITE PLAN
SCALE 1 : 200 @ A3

SCALE 1:200 — 2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

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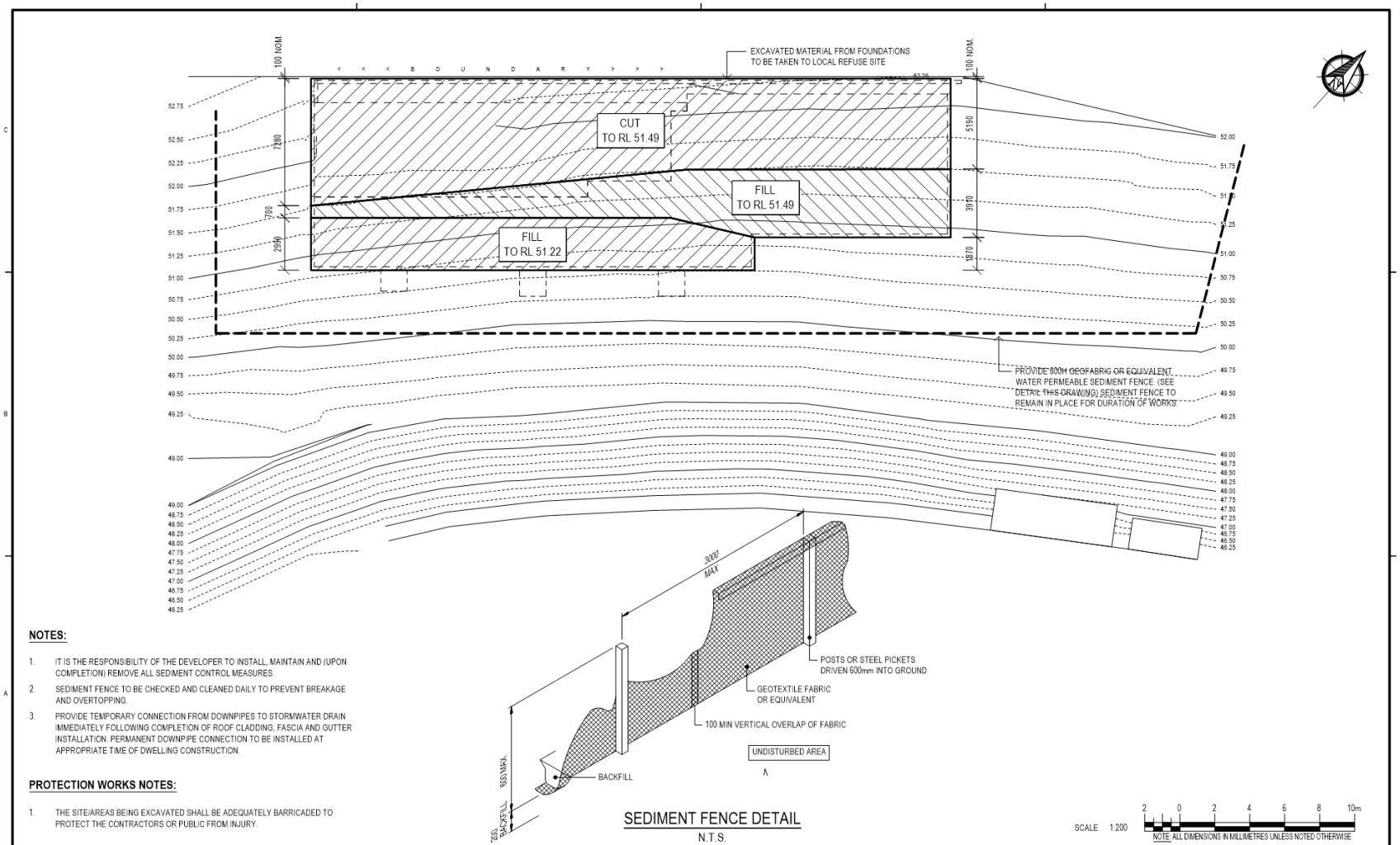
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

PART SITE PLAN

ORG No.	SHT.	SCALE	
NHO_K	002	1 : 200	A3



SEDIMENT FENCE DETAIL

N.T.S.

NOTES:

1. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL, MAINTAIN AND (UPON COMPLETION) REMOVE ALL SEDIMENT CONTROL MEASURES.
2. SEDIMENT FENCE TO BE CHECKED AND CLEANED DAILY TO PREVENT BREAKAGE AND OVERTOPPING.
3. PROVIDE TEMPORARY CONNECTION FROM DOWNPIPES TO STORMWATER DRAIN IMMEDIATELY FOLLOWING COMPLETION OF ROOF CLADDING, FASCIA AND GUTTER INSTALLATION. PERMANENT DOWNPIPE CONNECTION TO BE INSTALLED AT APPROPRIATE TIME OF DWELLING CONSTRUCTION.

PROTECTION WORKS NOTES:

1. THE SITE/AREAS BEING EXCAVATED SHALL BE ADEQUATELY BARRICADED TO PROTECT THE CONTRACTORS OR PUBLIC FROM INJURY.

SCALE 1:200 — 2 0 2 4 6 8 10m

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

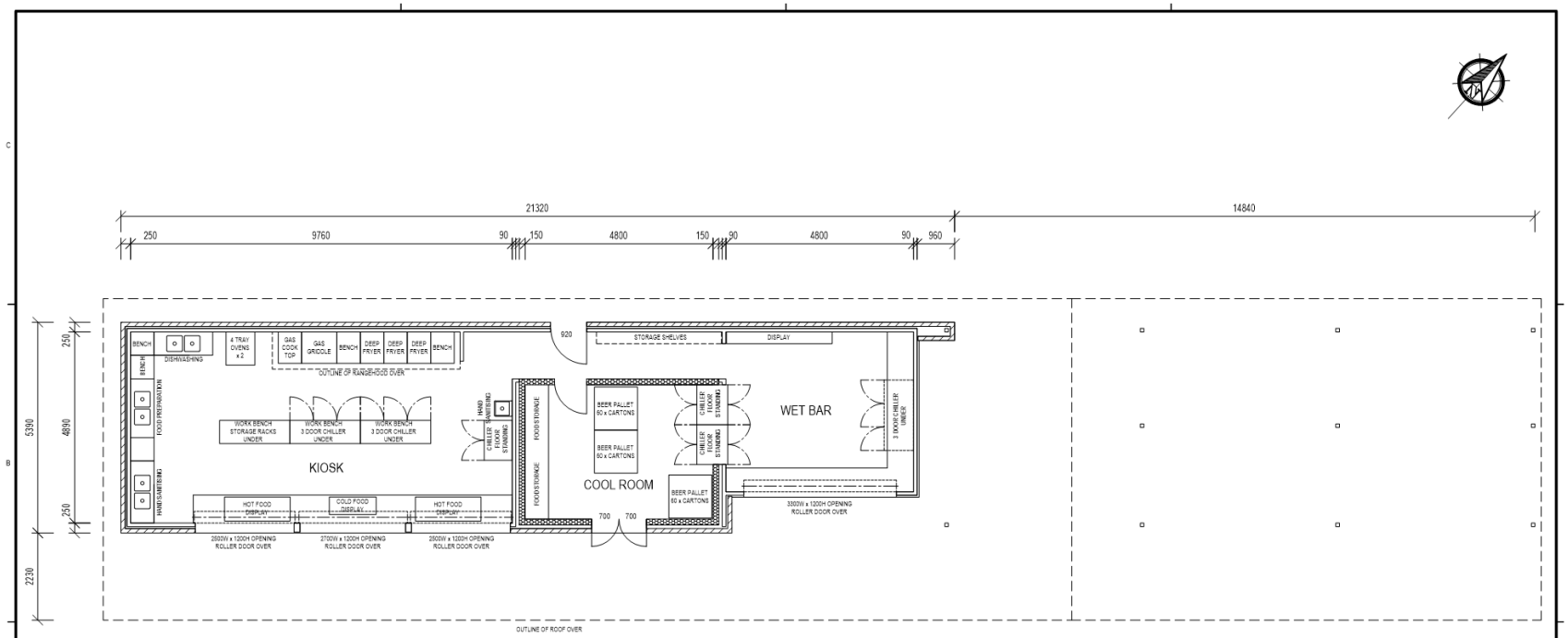
BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
CUT AND FILL PLAN /
SOIL AND WATER MANAGEMENT PLAN

ORG No.: NHO_K | SHT: 003 | SCALE: 1:200 | A3



FLOOR PLAN

SCALE 1 : 100 @ A3

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

A - AWNING
BF - BIFOLD DOOR
C - CUSTOM (BUTTED CORNER GLAZING)
F - FIXED
FR - FROSTED GLAZING
GB - GLASS BRICK
H - HINGED DOOR
S - SLIDING
SD - SLIDING DOOR
STKSD - STACKING TYPE SLIDING DOOR

FLOOR FINISHES LEGEND:

C - CARPET
CT - CERAMIC TILES
L - LINOLEUM
NC - NATURAL CONCRETE

SCALE 1:100 — 1000 0 1000 2000 3000 4000 5000mm

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2016

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

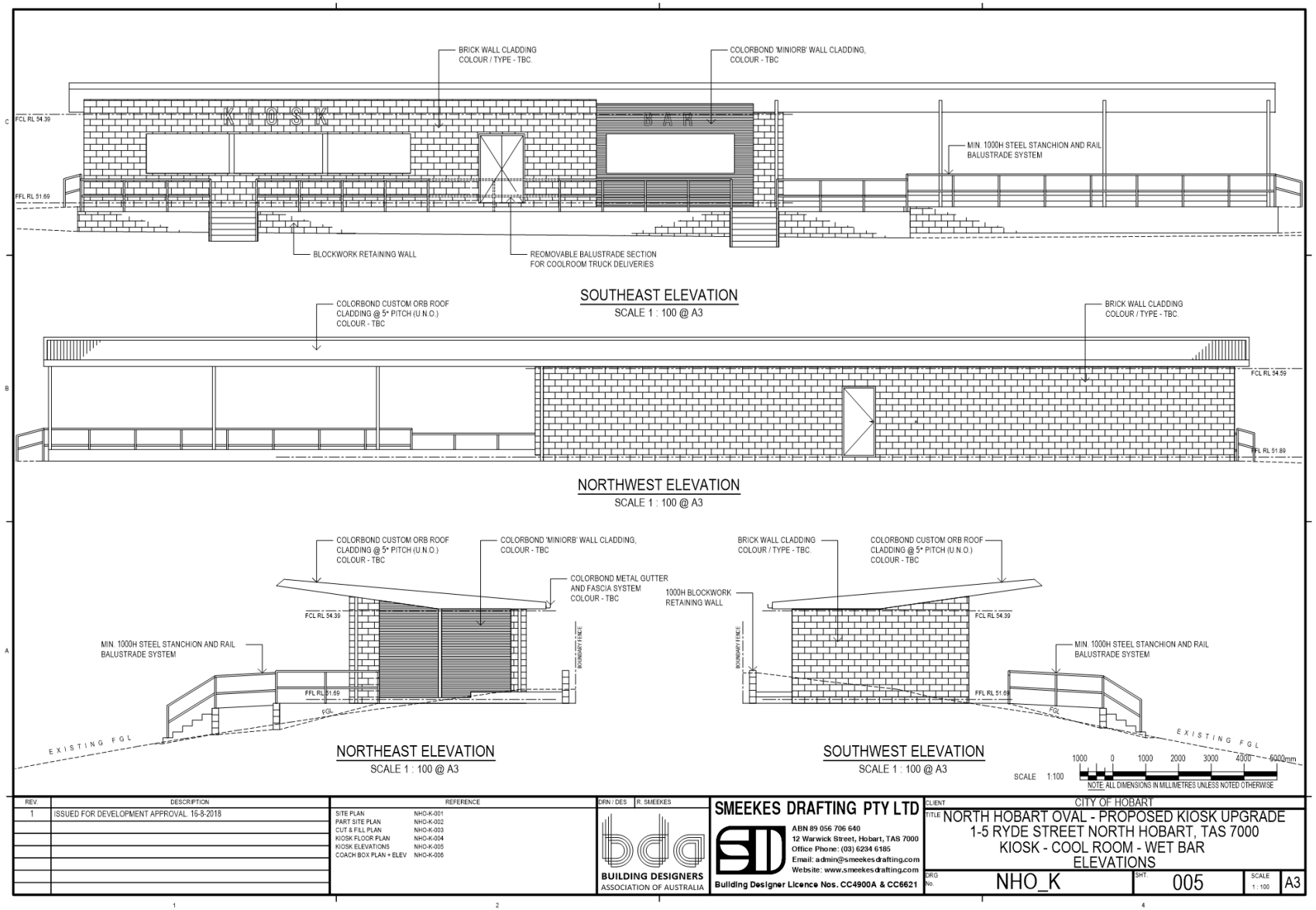
BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
FLOOR PLAN

DRG No.: NHO_K | SHT: 004 | SCALE: 1 : 100 | A3



REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

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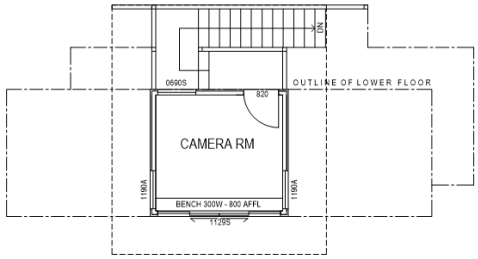
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
ELEVATIONS

ORG No.: NHO_K | SHT.: 005 | SCALE: 1 : 100 | A3



LEVEL 2 (CAMERA ROOM) FLOOR PLAN
SCALE 1 : 100 @ A3

FLOOR FINISHES LEGEND:

- C - CARPET
- CT - CERAMIC TILES
- L - LINOLEUM
- NC - NATURAL CONCRETE

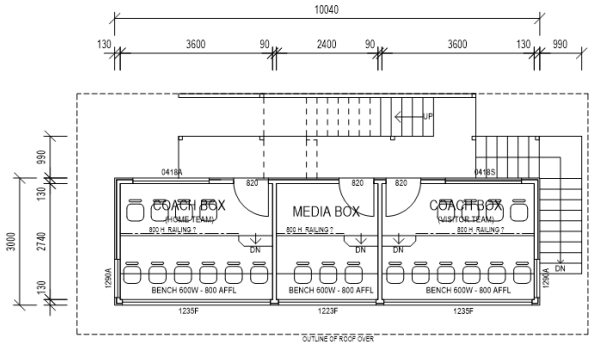
WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

- A - AWNING
- BF - BIFOLD DOOR
- C - CUSTOM (BUTTED CORNER GLAZING)
- F - FIXED
- FR - FROSTED GLAZING
- GB - GLASS BRICK
- H - HINGED DOOR
- S - SLIDING
- SD - SLIDING DOOR
- STKSD - STACKING TYPE SLIDING DOOR

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.



LEVEL 1 (COACHES + MEDIA) FLOOR PLAN
SCALE 1 : 100 @ A3

SCALE 1:100

1000 0 1000 2000 3000 4000 5000mm

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES R. SMEEKES

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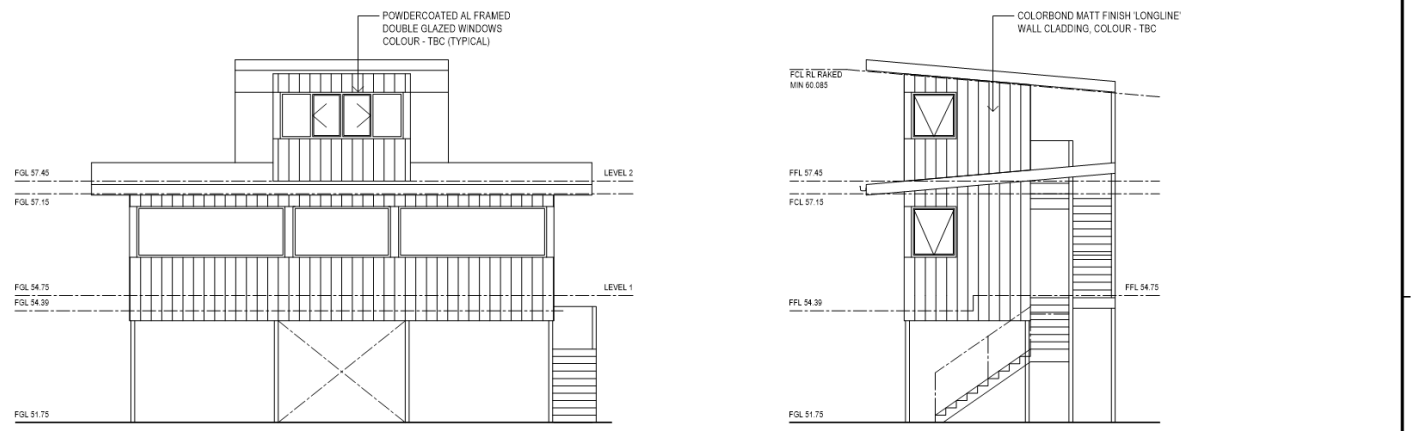
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

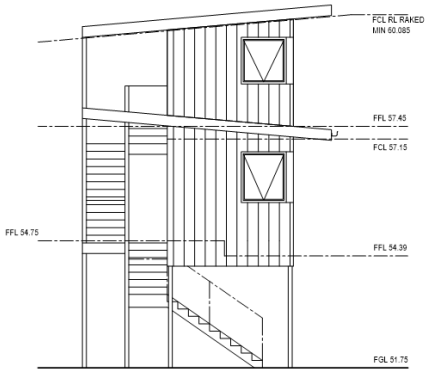
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
FLOOR PLANS

ORG No.: NHO_K | SHT.: 006 | SCALE: 1 : 100 | A3

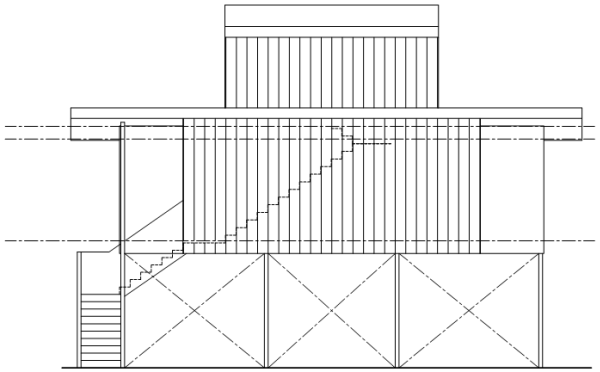


SOUTH ELEVATION
SCALE 1 : 100 @ A3

EAST ELEVATION
SCALE 1 : 100 @ A3



WEST ELEVATION
SCALE 1 : 100 @ A3



NORTH ELEVATION
SCALE 1 : 100 @ A3

SCALE 1:100

1000 0 1000 2000 3000 4000 5000mm

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

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Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
ELEVATIONS

ORG No.	SHT.	SCALE	
NHO_K	007	1 : 100	A3

APPENDIX B

Site History Information Requests

Image source: National Library of Australia (TROVE) http://digital.sl.nsw.gov.au/delivery/DeliveryManagerServlet?embedded=true&toolbar=false&dps_pid=IE3692317

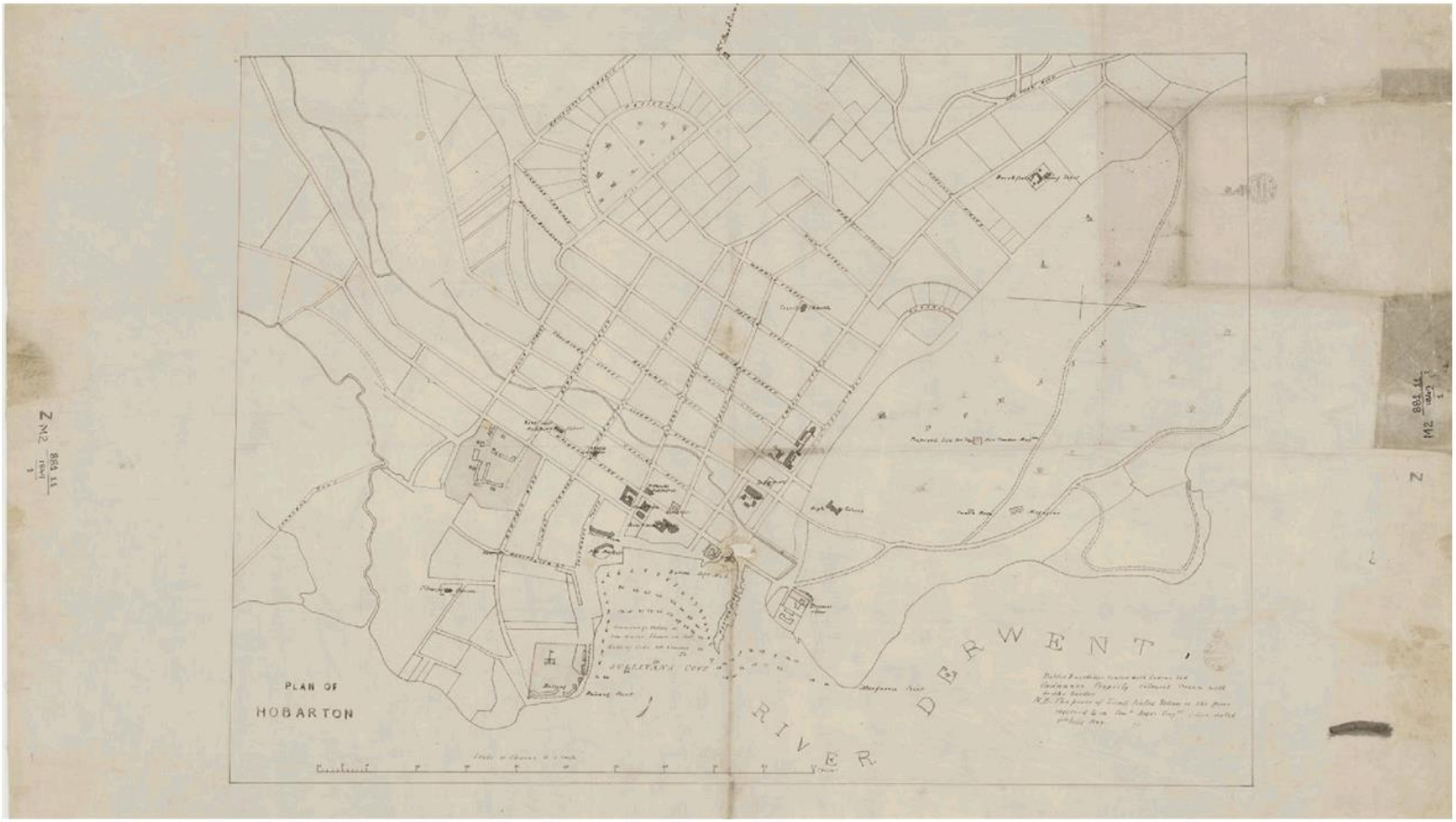


Image source: National Library of Australia (TROVE) http://digital.sl.nsw.gov.au/delivery/DeliveryManagerServlet?embedded=true&toolbar=false&dps_pid=IE3751304

Department of Justice – Dangerous Goods Records

Authority to Release Information to a Third Party Dangerous Substances Location

I, (full Name)
Paul Alexander Curtain, General Manager, North Hobart Football Club

authorise WorkSafe Tasmania to release information relating to Facility Number NA

Location of Facility (full address)
1-5 Ryde Street, North Hobart 7000

to (full Name)
Alex Lovibond

of (company Name)
Environmental Management & Consulting (EM&C)

Signature 30/8/2018 Date

Address
1-5 Ryde St, North Hobart

Phone | Mobile Phone 0409312889 | Email gm@nhfc.net.au

- [x] Current manifest
- [x] Current site plan
- [x] All historical information
- [x] Contamination issues
- [x] Decommissioning details
- [x] Other (please give details below)

Other Information required
Application is made in response to North Hobart Football Club's development application on potentially contaminated land. EM&C are acting on our behalf to investigate our site for contamination issues arising from any potentially contaminating activities that may have occurred either on our occupied property, or the neighboring property located at 393 Argyle Street. If you could please search your records for both our site and the neighboring property that would be greatly appreciated.

For further assistance please contact:

Department of Justice
WorkSafe Tasmania
PO Box 56, Rosny Park, TAS 7018
Phone: (in Tasmania) 1300 366 322; (outside Tasmania) - 03 6166 4600; Fax 03 6173 0206
Email: wstinfo@justice.tas.gov.au Website www.worksafe.tas.gov.au

Tasmanian Government

SITE MANIFEST

WORKPLACE STANDARDS TASMANIA
ABN 36 388 980 563

2661 - NORTH HOBART FOOTBALL CLUB INC

1 - 5 RYDE STREET
NORTH HOBART

Licence 28325 valid from to

Class	Description	Type	Size	L	Unit	Qty	Location	
2.1	LP GAS	CYLS	0.110	Y	L	4	???	Unknown storage location code :
2.1	LP GAS	CYLS	0.110	Y	L	10	???	Unknown storage location code :
2.1	LP GAS	CYLS	0.450	Y	L	1	???	Unknown storage location code :

Based on the above quantities,
facility is a DSL,
file closed 10/8/2011 LW

WORKPLACE STANDARDS TASMANIA

Enquiries: Keven Williams
Phone: (03) 6233 7652
Fax: (03) 6233 8338
Email: Keven.Williams@dier.tas.gov.au
Our Ref: 2661

9th January 2006

North Hobart Football Club Inc.
PO Box 38
North Hobart
TASMANIA 7002

Dear Sir or Madam:

DANGEROUS GOODS ACT 1998

LICENCE TO KEEP DANGEROUS GOODS

NORTH HOBART FOOTBALL CLUB INC., ARGYLE STREET, NORTH HOBART

SITE NUMBER: 2661

This letter is to advise you that whilst we have received payment for the renewal of your licence to keep dangerous goods for the period of 01/07/2005 to 30/06/2006, we have not received your **completed** *Section 1 of the Declaration* on the *Notice for Payment* form. Without this form your licence cannot be processed and issued.

In order to assist you, please find enclosed *Section 1 of the Declaration* on the *Notice for Payment* form. Please ensure that you **complete and return** the form to this office **no later than Monday 23rd January 2006**.

If you are keeping dangerous goods above the exemption limits specified in Schedule 3 of the *Dangerous Goods (General) Regulations 1998* without a current licence you expose yourself to possible prosecution.

If you have any queries please do not hesitate to contact Leza Wardlaw on 6233 8353.

Thank you for your co-operation.

Yours faithfully

K J Williams

Keven J Williams
SECTOR LEADER – STANDARDS
Encl.

Tasmania

NOTICE for PAYMENT

for Licence to Keep Dangerous Goods

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES

WORKPLACE STANDARDS TASMANIA
ABN 36 388 980 563

For period 01/07/2005 to 30/06/2006

NORTH HOBART FOOTBALL CLUB INC
PO BOX 38
NORTH HOBART 7002

Licensee No. 6252
Site No. 2661
Licence No. 17913
ABN. 48467609482
ACN.

Site Location
NORTH HOBART FOOTBALL CLUB INC
ARGYLE STREET
NORTH HOBART 7000

L P GAS	0.440 KL
L P GAS	1.100 KL
L P GAS	0.450 KL

COPY

Total Amount Payable: $46.80

PD 01/07/05

No **Important Information**
Declaration must be completed and returned with payment

Please note that this Notice for Payment is not a licence to keep dangerous goods. A licence will only be issued when payment for the amount shown on this Notice is made and an "Application for a Licence" form is completed and returned to Workplace Standards Tasmania. Failure to make this payment and return the completed form will mean that the site location referenced above is not licensed and therefore in breach of Regulation 9 of the Dangerous Goods (General) Regulations 1998. Please ensure that you make prompt payment so as not to expose yourself to possible prosecution. This fee is excluded from GST by a Determination by the Treasurer under Division 81 of the GST Act 1999.

1. **Declaration must be completed and returned with payment (Please print)**
Is the information contained on this Notice correct? (tick appropriate box) Yes ☐ No* (see below) ☐

Full Name: _____ Signature: _____

Position: _____ Date: _____

*Minor changes can be made directly onto this notice, and returned with payment (do not detach slip), otherwise contact Workplace Standards Tasmania

2. **Please detach and return this slip with cash/cheque/credit card to:**
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
Workplace Standards Tasmania
30 Gordons Hill Road / PO Box 56
ROSNY PARK TAS 7018
Ph 1300 366 322 Fax (03) 6233 8338

or

any **Service Tasmania** outlet

Licensee No. 6252
Site No. 2661
Licence No. 17913
Service Tas Code: 302

Credit Card Details: Mastercard ☐ Visacard ☐ Bankcard ☐ Amount Paid: $ 46.80 PD 01/07/05

Credit Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiry Date: __/__

Cardholder's Name: *(Block Letters)*	Phone No:	Signature:

WORKPLACE STANDARDS TASMANIA

Enquiries: Leza Wardlaw
Phone: 03 6233 8353
Fax: 03 6233 8338
Email: Leza.Wardlaw@dier.tas.gov.au
Your Ref:
Our Ref: 2661

North Hobart Football Club Inc
PO Box 38
NORTH HOBART TAS 7002

Dear Sir/Madam

DANGEROUS GOODS ACT 1998

LICENCE TO KEEP DANGEROUS GOODS
NORTH HOBART FOOTBALL CLUB INC, ARGYLE STREET, NORTH HOBART
SITE NO. 2661

Thank you for the payment for the renewal of *Licence to Keep Dangerous Goods* for the above referenced site location for the period 01/07/2005 to 30/06/2006.

Unfortunately you overlooked completing Section 1 of the Declaration on the *Notice for Payment* form (original enclosed). Please arrange for this Section to be completed and return to Workplace Standards as this declaration is required for the licence to be processed and issued.

Yours faithfully

Daryl Gillie
SECTOR LEADER - STANDARDS

5 July 2005

~~SSS~~

(please print)

Is the information contained on this Notice correct? (tick appropriate box) Yes ☐ No* (see below) ☐

Full Name: _____ Signature: _____

Position: _____ Date: _____

*Minor changes can be made directly onto this notice, and returned with payment (do not detach slip), otherwise contact Workplace Standards Tasmania

2. **Please detach and return this slip with cash/cheque/credit card to:**
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
Workplace Standards Tasmania
30 Gordons Hill Road / PO Box 56
ROSNY PARK TAS 7018
or any Service Tasmania outlet

- 1 JUL 2005
ROSNY

Licensee No. 6252
Site No. 2661
Licence No. 17913
Service Tas Code: 302

Credit Card Details: Mastercard ☐ Visacard ☐ Bankcard ☐ Amount Paid: $ **46.80**

Credit Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiry Date: ___/___

1 - JUL 2005
BY: 7693

Cardholder's Name: *(Block Letters)*	Phone No:	Signature:

(F)

1. **Declaration must be completed and returned with payment (Please print)**
Is the information contained on this Notice correct? (tick appropriate box) Yes ☑ No* (see below) ☐

Full Name: RUSSELL JAMES MANNING Signature:

Position: GENERAL MANAGER Date: 10/1/06.

*Minor changes can be made directly onto this notice, and returned with payment (do not detach slip), otherwise contact Workplace Standards Tasmania

2. **Please detach and return this slip with cash/cheque/credit card to:**
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
Workplace Standards Tasmania
30 Gordons Hill Road / PO Box 56
ROSNY PARK TAS 7018
Ph 1300 366 322 Fax (03) 6233 8338

or
any **Service Tasmania** outlet

WORKPLACE STANDARDS TASMANIA 17 JAN 2006 ROSNY

Licensee No. 6252
Site No. 2661
Licence No. 17913
Service Tas Code: 302

Credit Card Details: Mastercard ☐ Visacard ☐ Bankcard ☐ Amount Paid: $ **46.80** PD 01/07/05

Credit Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiry Date: ___/___

Cardholder's Name: *(Block Letters)*	Phone No:	Signature:

Tasmania

DEPARTMENT of INFRASTRUCTURE, ENERGY & RESOURCES
WORKPLACE STANDARDS TASMANIA
PO BOX 56 ROSNY PARK TAS 7018
TELEPHONE: 1300 366 322
OR (03) 6233 7657
FAX (03) 6233 8338

WORK PLACE STANDARDS TASMANIA 16 JUN 2003 ROSNY

APPLICATION FOR A LICENCE TO KEEP DANGEROUS GOODS (KEEPER'S LICENCE)
DANGEROUS GOODS ACT 1998
DANGEROUS GOODS (GENERAL) REGULATIONS 1998

PLEASE READ THE GUIDANCE NOTES ON THE REVERSE SIDE OF THIS PAGE FOR TERMS USED BEFORE COMPLETING THIS APPLICATION FORM

Please print in BLOCK letters

F

1. TYPE OF APPLICATION (Please tick a box)

Renewal of existing licence ☑ New licence ☐ Transfer of a licence ☐

For renewal or transfer please indicate the existing site number (shown on the Notice for Payment) 2661

2. INTENDED LICENSEE

Name (Business: incorporated company name, or the position and name of a senior person in the company. Private: the owners name)
NORTH HOBART FOOTBALL CLUB INC

ACN (business only)	ABN (business only)	Telephone	Fax
—	~~ABN 48 467 609 482~~	6234 3473	6231 2132

Mailing address (Street/PO Box)	Suburb	State & Postcode
PO BOX 38	NORTH HOBART	TAS 7002

Email NHFC @ SOUTHERNFOOTBALL.COM (Lower case)

I certify that the information contained on this application is accurate and correct:

Name (if same as above, please write 'as above') RUSSELL MANNING Position SECRETARY

Signature of licensee [signature] Date 12/6/03

3. DEPOT TO BE LICENSED (ADDRESS WHERE THE GOODS ARE STORED)

Business Trading Name (or the name of the owner of a private depot) North Hobart Football Club Inc

Street address of depot	Suburb	Postcode

Site telephone	Site fax	Name of occupier (or owner of a private store)

4. CONTACT DETAILS (provide details of the person who should be contacted about information contained in this form, if different to licensee)

Name	Position

Mailing address (Street/PO Box)	Suburb	State & Postcode

Telephone/Mobile	Fax

Email

GUIDANCE NOTES FOR TERMS USED IN THIS APPLICATION FORM

Please read these notes before completing the *Application to Keep Dangerous Goods (Keeper's Licence)* form.

dangerous goods	any substance prescribed as dangerous goods, or a substance or article determined by Workplace Standards Tasmania (the Competent Authority) in accordance with the Regulations, to be dangerous goods
depot/site	any store, warehouse, premises or land used for storing dangerous goods
keeper's licence	a licence issued by Workplace Standards Tasmania to a licensee to keep or store dangerous goods at a particular depot/site
licence	a keeper's licence in force under the *Dangerous Goods (General) Regulations 1998*
licensed depot	a depot in relation to which a licence is issued under the *Dangerous Goods (General) Regulations 1998*
licensee	the holder of a licence to keep dangerous goods. The licensee needs to be a legal entity, that is a company, or a natural person - someone who will assume responsibility for the dangerous goods at the depot to be licensed. The licensee does not need to be the occupier of the depot. The trading name of the business should not be entered here.
licensee number	the licence number issued by Workplace Standards Tasmania to licensees
occupier of a depot	means the person who occupies the depot/site such as a manager, employer, a site owner or tenant. The occupier does not have to be the same person as the licensee.
Regulations	*Dangerous Goods (General) Regulations 1998.* The Regulations applicable to this application form are Regulations 9(5) and 10(1).
site number	the site number allocated to a specific depot/site, issued by Workplace Standards Tasmania
street address of depot	street address of the depot/site where the dangerous goods will be kept. Please do not use a post office box number for the street address of the depot.

PLEASE FORWARD COMPLETED FORM TO:
WORKPLACE STANDARDS TASMANIA PO BOX 56 ROSNY PARK TAS 7018
PHONE: 1300 366 322 OR (03) 6233 7657 FAX: (03) 6233 8338

Issue date May 2003

Tasmania

DEPARTMENT *of*
INFRASTRUCTURE,
ENERGY *and* RESOURCES
WORKPLACE STANDARDS TASMANIA

Enquiries: Daryl Gillie
Phone: 6233 7662
Fax: 6233 8338
Email: Daryl.Gillie@dier.tas.gov.au
Your Ref:
Our Ref: 2661

25 January 2001

North Hobart Football Club
PO Box 38
NORTH HOBART TAS 7002

DANGEROUS GOODS ACT 1998

Dear Sir or Madam

RE: Site Number 2661 - Argyle Street, North Hobart

On or about 1 June 2000, an invoice was mailed to you for the renewal of your licence to keep dangerous goods up to the period ending 31 June 2001.

Workplace Standards Tasmania (WST) has no record of the payment of the licence fee, or receipt of notification in writing of any change in circumstances at the site that would indicate that you no longer have an obligation to be licensed.

Statement of account as at 31 August 2000 was forwarded to you during the first week of September 2000, to which WST still have no record of a response.

The circumstances that may have lead to no response from you could have included:-

1. You may have sold the premises, which is still operating with the dangerous goods storage as previously licensed. However, there may have been an oversight and change of ownership/transfer of ownership may not have been forwarded to WST.

2. The dangerous goods stored no longer exceed the licensable quantities listed in Schedule 3 of the [Dangerous Goods (General) Regulations 1998] ['Regulations'].

3. You may still own the site, but no longer operate a dangerous good storage facility. If this being the case you are required to notify WST and sign the appropriate statutory declaration. The declaration must state that the storage facility has been decommissioned and the site rehabilitated in accordance with the relevant Australian Standards or Code of Practice. A statutory declaration is enclosed. It should be noted that a dangerous goods facility which is no longer in use and not abandoned in the correct manner, is deemed to be an operative dangerous goods facility and requires licensing.

Should you require further information on the abandonment of a dangerous goods storage site please contact WST.

4. You are still operating a dangerous goods storage facility that is subject to the licensing requirements of the *Dangerous Goods Act 1998* and Regulations, and have failed for whatever reason to renew the licence.

   At present you are operating an unlicensed dangerous goods facility. This is in breach of sub-regulation 9(5) of the regulations, and carries a maximum penalty of 10 penalty units*.

   If WST does not receive renewal of the license or advice to reasons why a license is no longer required by 16 February 2001, officers of WST will visit your premises for the purpose of collecting evidence for forwarding to the Director for Public Prosecutions, with the recommendation that legal proceedings be initiated against you.

Please note, the granting of a licence to store dangerous goods:-

1. Places upon you the responsibility to ensure the storage facility is used and operated safely and that measures to deal with an emergency are in place and operational:- and

2. All staff receives the required and appropriate training in the safe operation of the facility and understands the required emergency procedures.

For further advice in relation to this matter please contact Workplace Standards Tasmania on 1300 366 322.

Yours faithfully

S J Hyam
DELEGATE of the COMPETENT AUTHORITY
Encl:

*** 1 penalty unit = $100.00**

A4 04/93 RATOR

THIS FORM MUST BE RETURNED WITH PAYMENT

FORM 5 Regulation 36 (5)

Dangerous Goods Act 1976

APPLICATION FOR LICENCE IN RESPECT OF PREMISES FOR KEEPING DANGEROUS GOODS

1. Applicant's full name North Hobart Football Club
2. Applicant's occupation
3. Postal address PO Box 38, North Hobart
4. Situation of premises to be licensed Argyle Street, North Hobart
5. Name of municipality and town or township within which, or within 5 kilometres of which, premises are situated Hobart
6. Name and total quantity to be kept—

Explosives (Class 1)

Name	Class	Compatibility Group	Maximum quantity
Gunpowder	1·1	D	kilograms
Blasting	1·1	D	kilograms
Propellants	1·1	C	kilograms
Detonating fuse	1·1	D	metres
Detonators	1·1	B	only

L.P. Gas (Class 2) 6 x 45 kg kilograms

Flammable liquids, Class 3·1 and Class 3·2 (petrol, &c.) kilolitres

Flammable liquids, Class 3·3 and Class 3·4 (kerosene, &c.) kilolitres

Other dangerous goods:

7. Total number of tanks and package storage areas installed 6 cylinders

I declare that the above statements and answers are true to the best of my knowledge and belief.

Dated this 2ND day of April 1991

(Signed) DIRECTOR M.H.F.C

½ year fee

This Application, with Licence Fee of $10.00, *to be forwarded to the address below within 7 days—*

DIRECTOR OF MINES—Dept. of Resources and Energy, Division of Mines
BLIGH STREET (PO Box 56)
ROSNY PARK 7018

FOR OFFICE USE ONLY

File 2661	Receipt No. PAID 4 APR 1991		**Initials**
	Amount of Cash/Cheque	$	
Licence No. 12943	Date 10330		

1.8.90 M. C. REED, Government Printer, Tasmania K 8668

INSPECTION REPORT - 001

KEEPING DANGEROUS GOODS

MINES
File Ref. 26161
31 OCT 1990
Doc. Ref. 970
Action Officer | Initials
RAP
CB
Resubmit to | Date

FILE NO: N/k AREA CODE MBOL DATE 14.9.90

BUSINESS TRADING NAME:
North Hobart Football Club

OWNER/OCCUPIER:
As Above

POSTAL ADDRESS: P.O. Box 38
North Hobart

LOCATION OF STORAGE: Argyle St
North Hobart

Licence No. 12943 | Debtors No. A41050

APPROVAL DATE: 14.6.90 APPROVAL NO: 8257 INSPECTION DATE: 14.9.90

TYPE OF INSPECTION : APPROVAL/FOLLOW-UP/ROUTINE/NEW/ADDITIONAL [redacted]

RECOMMENDED FOR LICENSING: YES/~~NO~~ INSPECTOR: [signature]

REMARKS:

Name of dangerous goods	Class	No. of tanks	Size of tanks	O/G O/H U/G	No. of and type of pumps	No. of cylinders drums packages	Size of cylinders drums packages
L.P.Gas	2.1					6	45kg Total = 530l

RESUBMIT DATE: TO:

FORM 4 (Regulation 34)

TASMANIA

Rec 65168

Dangerous Goods Act 1976

№ 8257

$20

Fee: $10

GRANTED TO..... [redacted] .....

.....

.....

Approval of Site and Construction of Premises for Keeping Flammable Liquids or Dangerous Commodities or the Alteration thereof

---

Approval for the *site and construction/*alteration of the site and construction as shown on the approved plans and specifications of a *package/*storage area/*tank for the undermentioned flammable liquids and dangerous commodities, subject to the provisions of the *Dangerous Goods Act 1976*, and regulations being observed and subject to the undermentioned special conditions, situate at .....

.....North Hobart Football Club, Argyle Street, North Hobart.....

This approval is valid only for one year from the date of issue.

Date of issue.....14 June.....19.90....

.....
Chief Inspector of Explosives

.....
Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
LP Gas	2.1	6 x 45 kg Cylinders

SPECIAL CONDITIONS

.....

.....

.....

*Strike out if inapplicable

OW 450 I. C. CARTER, Acting Government Printer, Tasmania

File No. 2661
Date .....

Mining Engineer, BURNIE		M. Robertson, HOBART	✓
M. Heuson, LAUNCESTON		C. Gardner, HOBART	
J. Coffey, BURNIE		E. Garlick, HOBART	
D. Wildmore, LAUNCESTON			
P. Davis, HOBART			

Subject: North Hobart Football Club

Address: .....

Proposal: LPGAS 2x45kg

Quality of Plans acceptable YES ✓ NO ☐

May I have your Recommendation Please.

pp MGlead
Senior Dangerous Goods Inspector

Receipt No. 65168
Date 23.5.90

PLAN RECOMMENDATION REPORT

Premises Address: ARGYLE ST.

Owner: NORTH HOBART FOOTBALL CLUB.

Occupier and Use: COMMERCIAL CATERING

Plan Submitted By: [redacted]

Address: [redacted]

	PRODUCT	QUANTITY	CLASS
Proposal For:	LPG.	.510KL.	2.1

The above plans were checked, and Site inspected and the following is recommended.

Suitable for approval: YES.

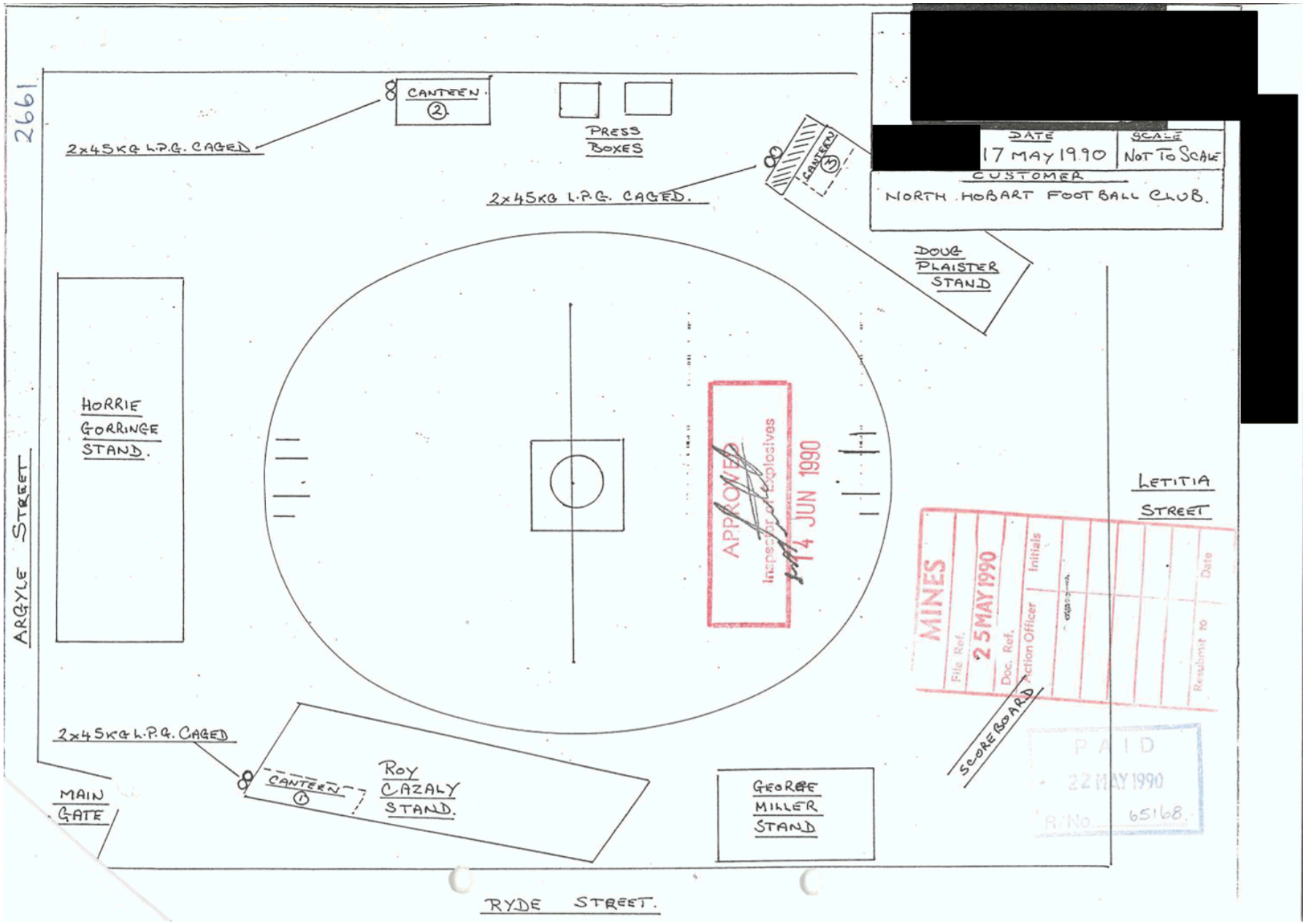
Subject to: .....

Not suitable for approval: .....

Reason: .....

DANGEROUS GOODS INSPECTOR

Fee Attached YES ☐ NO ☐


2661
CANTEEN ②
PRESS BOXES
2x45KG L.P.G. CAGED
2x45KG L.P.G. CAGED.
CANTEEN ③
[redacted]
DATE
17 MAY 1990
SCALE
NOT TO SCALE
CUSTOMER
NORTH HOBART FOOT BALL CLUB.
DOUG PLAISTER STAND
HORRIE GORRINGE STAND.
ARGYLE STREET
APPROVED
Inspector of Explosives
14 JUN 1990
LETITIA STREET
MINES
File Ref.
25 MAY 1990
Doc. Ref.
Action Officer
Initials
Date
Resubmit to
SCOREBOARD
PAID
22 MAY 1990
R/No. 65168.
2x45KG L.P.G. CAGED
CANTEEN ①
ROY CAZALY STAND.
GEORGE MILLER STAND
MAIN GATE
RYDE STREET.

[redacted] To be licenced refer Approval No. 8257 dated 14.6.90

ORIGINAL

DEPT. OF MINES

TASMANIA

MINES
File Ref.
17 MAY 1990
Doc. Ref.
Action Officer
MJR
Result to

No. 12013

START WORK NOTICE FOR L.P. GAS SYSTEMS

Applies to installations of fixed systems in any building, caravan or marine craft subject to the relevant A.L.P.G.A. Installation Codes and the S.A.A. L.P. Gas Code 1596—1973; and to any alteration of existing pipework subject to Section 2.5 of the S.A.A. L.P. Gas Code 1596—1973.

Installer [redacted] Registration No. [redacted]

Location of premises: North Hobart Oval Argyle St North Hobart

Owner: North Hobart Football Club

Address of owner N/A.

Type of premises: domestic*, commercial*, industrial*, caravan*, marine craft*.

Installation: new*, addition*, or repair*. Kiosk 1- 2x45kg Kiosk 2- 2x45 kg Kiosk 3- 2x45 kg

Signature of Installer: [redacted]

CERTIFICATE OF TEST

This installation has been installed*, altered*, and/or repaired* according to Regulations 44*, 45* and/or 46* of the Dangerous Goods Regulations 1976, and has been tested in accordance with Section 2.3 of the S.A.A. L.P. Gas Code AS 1596—1973.

Signature of Installer: [redacted] Date: 3/5/90.

GAS SUPPLIER'S ENDORSEMENT

To be completed in respect of new installations only.

The above installation has been inspected according to Section 2.4.1 of the S.A.A. L.P. Gas Code AS 1596—1973.

Name of Gas Supplier: [redacted]

Signature: [redacted]

* Delete whichever is not applicable.

33356 NAPP—143

Division of Mines & Mineral Resources
Dangerous Goods Inspectorate - 001 Inspection

Site No: 2661
Zone: MR01
Licence No:
Type: D
Status: L

Business Name: NORTH HOBART FOOTBALL CLUB
Owner Occupier: "DEMONS"
Site Address: ARGYLE ST
Site City: NORTH HOBART
Site State: _____ Pcode: _____
Supplier: [redacted]

Debtor No:
Debtor Name: [redacted]
Debtor Address: _____
Debtor City: _____
Debtor State: _____ Pcode: _____

Insp Date: 05-12-91 Inspector: RJR
Approval ✓ Follow Up ☐ Routine ☐ New ☐ Additional ✓
Approval Date: 04-12-91 Approval No: 3194

Comments _____

DATA ENTRY

Add Site ☐ Increase Storage ✓
Modify Site ☐ Reduce Storage ☐
Cancel Site ☐ Routine ☐
Date 06/12/91
User [redacted]

MINES
File Ref. 2661
- 6 DEC 1991
Doc. Ref. 3194
Action Officer CB Initials
Resubmit to Date

STORAGE DETAILS

CODE	TYPE	SIZE	UNIT	QUANTITY	LOCN
LPG	CyL.	.380	KL	1	

FORM 4 (Regulation 36 (4))

TASMANIA

344

111010

Dangerous Goods Act 1976

Approval of Site and Construction of Premises for Keeping Dangerous Goods or the Alteration of the Site and Construction of those Premises

Fee: $20
$50

GRANTED TO North Hobart Football Club

Argyle Street

NORTH HOBART TAS 7000

Approval for the *site and construction/*alteration of the site and construction as shown on the approved plans and specifications of premises for the undermentioned dangerous goods, subject to the provisions of the *Building Regulations* and the *Dangerous Goods Act 1976*, being complied with and subject to the undermentioned special conditions, situated at:

as above

This approval is valid for a period of one year from the date of issue.

Date of issue 4 December 19 91

Chief Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
LPG	2.1	190 kg

SPECIAL CONDITIONS

*Strike out if inapplicable

O/W 450 M. C. REED, Government Printer, Tasmania 1.8.90

Form 8

Regulations 46 (2)
47 (2) and 48 (2)

TASMANIA

4615

START WORK NOTICE FOR L.P. GAS SYSTEMS

This notice is required for the installation, alteration or repair of an L.P. Gas System in accordance with Regulations 46, 47 and 48 of the *Dangerous Goods Regulations 1990.*

Installer: [redacted] Registration No.: [redacted]

Installation Address: North Hobart Football Club. Social Club – Ryde Street North Hobart

Owner: North Hobart Football Club.

Address of Owner: A/A.

Supply Capacity: 1 x 190kg (Bulk Pipework In)

Type of system: domestic*, commercial*, industrial*, caravan*, ~~marine craft*~~, educational*, food van*, ~~hose test*~~.

Installation: new*, addition*, or ~~repair*~~.

Signature of Installer [redacted]

MINES DEPT. USE ONLY

MINES
File Ref. 2661
24 JAN 1992
Doc. Ref.
Action Officer: CB, MR
Initials
Resubmit to
Date

CERTIFICATE OF TEST

This installation has been installed*, ~~altered*~~, or ~~repaired*~~ in accordance with Regulations 46*, 47* or 48* of the *Dangerous Goods Regulations 1990* and has been tested in accordance with SAA L.P. Gas Code 1596 and compliance plate securely attached.

Signature of Installer: [redacted] Date: 25/11/91

GAS SUPPLIER'S/AGENTS ENDORSEMENT

To be completed in respect of new installations only.

The above installation has been inspected in accordance with the SAA L.P. Gas Code 1596 and compliance plate checked

Name of Gas Supplier/Agent: [redacted]

Signature [redacted] Dept. of Resources and Energy. Approval No. CCT4

* Delete whichever is not applicable.

ORIGINAL (White) Dept. of Mines
DUPLICATE (Green) Gas Supplier
TRIPLICATE (Blue) Gas Supplier, Dept. of Mines
QUADRUPLICATE (Pink) Customer
QUINTUPLICATE (Yellow) Book Copy

M. C. Reed, Government Printer, Tasmania K 7973

File No. 2661
Date 20.11.91

Mining Engineer, BURNIE	☐	M. Robertson, HOBART	☑
M. Heuson, LAUNCESTON	☐	C. Gardner, HOBART	☐
J. Coffey, BURNIE	☐	E. Garlick, HOBART	☐
D. Wildmore, LAUNCESTON	☐		
P. Davis, HOBART	☐		

Subject: NORTH HOBART FOOTBALL CLUB
Address: ARGYLE ST NORTH HOBART
Proposal: 1 x 190 LPG.

Quality of Plans acceptable YES ☑ NO ☐

May I have your Recommendation Please.

.....
Senior Dangerous Goods Inspector

Receipt No. 111010
Date 20-11-91

PLAN RECOMMENDATION REPORT

Premises Address: ARGYLE ST NORTH HOBART
Owner: N/HOBART F.B.C.
Occupier and Use: .....
Plan Submitted By: [redacted]
Address: [redacted]

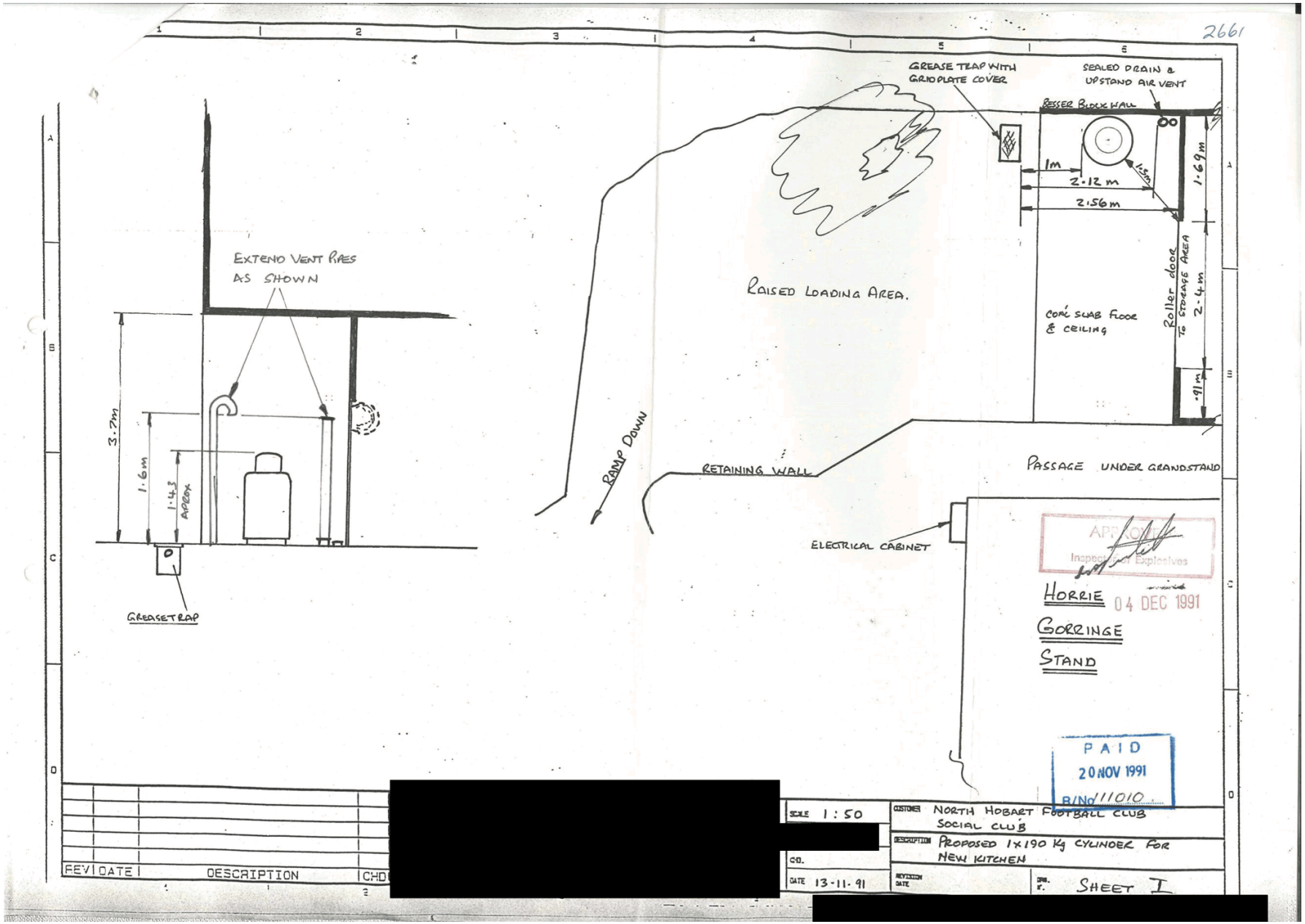
	PRODUCT	QUANTITY	CLASS
Proposal For:	LP.G.	190KG	2.1

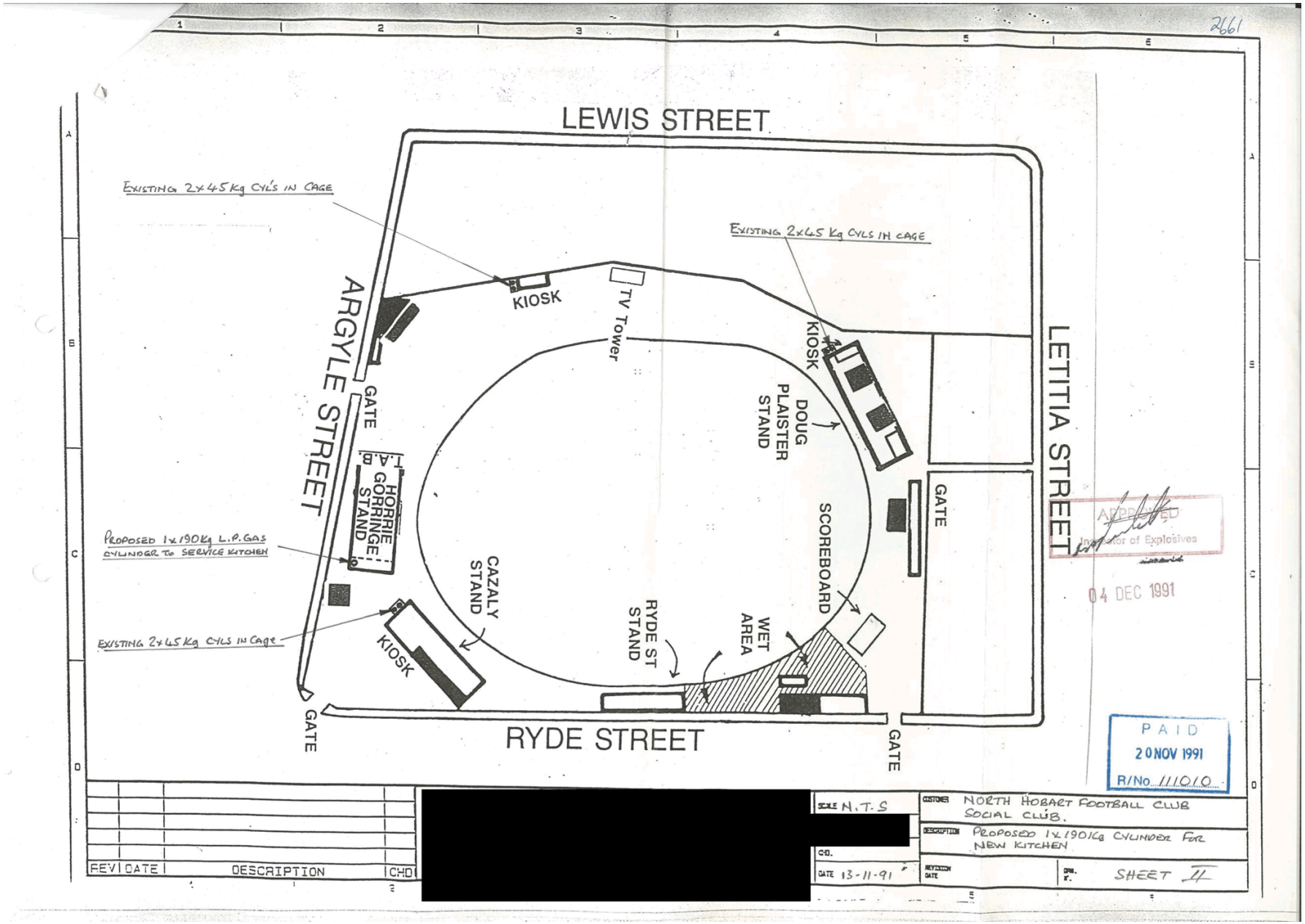
The above plans were checked, and Site inspected and the following is recommended.

Suitable for approval: YES
Subject to: .....
.....
Not suitable for approval: .....
Reason: .....
.....
DANGEROUS GOODS INSPECTOR:

Fee Attached YES ☐ NO ☐

MINES
File Ref. 2.6.6.1
28 NOV 1991
Doc. Ref. 3997
Action Officer CB Initials
Resubmit to Date


2661
GREASE TRAP WITH GRIDPLATE COVER
SEALED DRAIN & UPSTAND AIR VENT
BESSER BLOCK WALL
1m
2·12 m
2·56 m
1·69m
1·5m
EXTEND VENT PIPES AS SHOWN
RAISED LOADING AREA.
CONC SLAB FLOOR & CEILING
ROLLER DOOR TO STORAGE AREA
2·4m
·91m
3·7m
1·6m
1·43 APPROX
RAMP DOWN
RETAINING WALL
PASSAGE UNDER GRANDSTAND
ELECTRICAL CABINET
GREASE TRAP
APPROVED
Inspector of Explosives
HORRIE 04 DEC 1991
GORRINGE
STAND
PAID
20 NOV 1991
B/No 111010
REV DATE DESCRIPTION CHD
SCALE 1:50
CO.
DATE 13-11-91
CUSTOMER NORTH HOBART FOOTBALL CLUB SOCIAL CLUB
DESCRIPTION PROPOSED 1x190 Kg CYLINDER FOR NEW KITCHEN
REVISION DATE
DRG. Nº SHEET 1


2661
LEWIS STREET
ARGYLE STREET
LETITIA STREET
RYDE STREET
EXISTING 2x45 Kg CYLS IN CAGE
EXISTING 2x45 Kg CYLS IN CAGE
KIOSK
TV Tower
KIOSK
GATE
DOUG PLAISTER STAND
HORRIE GORRINGE STAND
SCOREBOARD
GATE
PROPOSED 1x190Kg L.P. GAS CYLINDER To SERVICE KITCHEN
CAZALY STAND
RYDE ST STAND
WET AREA
EXISTING 2x45 Kg CYLS IN Cage
KIOSK
GATE
GATE
APPROVED
Inspector of Explosives
04 DEC 1991
PAID
20 NOV 1991
R/No. 111010
REV DATE DESCRIPTION CHD
[redacted]
SCALE N.T.S
CHD.
DATE 13-11-91
CUSTOMER NORTH HOBART FOOTBALL CLUB SOCIAL CLUB.
DESCRIPTION PROPOSED 1x190Kg CYLINDER FOR NEW KITCHEN
REVISION DATE
DRG. No. SHEET 1

[redacted]

Declaration of Installation Compliance.

I, [redacted] (Fitter) / ~~Engineer~~, employee / (contractor) to [redacted] hereby declare that the installation completed at:

NORTH HOBART FOOTBALL CLUB

RYDE ST N/HOBART

has been installed in accordance with the approval conditions of the issued licence to store dangerous goods. SITE LICENCE NO. 1910

In addition to this the installation complies with the requirements of the Dangerous Goods Regulations 1994.

Signature [redacted] Date: 11/2/98

Checklist:

Licence sighted:	(Yes) N/A
Installed in accordance with plan:	(Yes) N/A
Complies with AS1596:	(Yes) N/A
Complies with A.G.A. Codes:	(Yes) N/A
Start Work Notice completed:	(Yes) N/A

Countersigned:

[redacted]

This declaration has been signed before me: .....

~~Signature~~: [redacted] Date: 11/2/98.

Title: .....

FORM 4

(Regulation 52)

TASMANIA

1910

Dangerous Goods Act 1976

Rec No. 175280

Approval of Site and Construction of Premises for Keeping Dangerous Goods or the Alteration of the Site and Construction of those Premises

GRANTED TO: [redacted]

Fee: $50

Approval for the site and construction as shown on the approved plans and specifications of premises for the undermentioned dangerous goods, subject to the provisions of the Building Regulations and the Dangerous Goods Act 1976, being complied with and subject to the undermentioned special conditions, situated at:

North Hobart Football Club
Ryde Street
NORTH HOBART Site: 2661

This approval is valid for a period of one year from the date of issue.

Date of issue: 18 March 1997

.....
Chief Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
L P Gas	2.1	4 x 45 KG

SPECIAL CONDITIONS

Compliance with Dangerous Goods Regulations and in particular AS 1596.

PLACARDING REQUIRED

HAZCHEM	
2WE	

ICATION FORM

APPLICATION FOR LICENCE TO STORE DANGEROUS GOODS

PART A - APPLICANT AND PREMISES DETAILS 1910

1. INTENDED LICENSEE

NAME: North Hobart Football Club

MAILING ADDRESS: PO Box 38

NORTH HOBART POSTCODE [redacted]

SIGNATURE: ..... DATE: .....

CONTACT NAME: ..... PH: ..... FAX: .....

2. PREMISES TO BE LICENSED

BUSINESS TRADING NAME: As Above

ADDRESS: Rydc Street North Hobart
LOT NO. STREET NO. X

TOWN: ..... POST CODE: 7000

NATURE OF BUSINESS: Sports Club

PURPOSE OF STORAGE: cooking / Hot Water

SHIRE/LOCAL AUTHORITY: Hobart City Council

OFFICE USE ONLY

3. PLANS SUBMITTED BY

NAME: [redacted]

ADDRESS: [redacted]

TOWN: [redacted] POST CODE: [redacted]

ATTENTION: [redacted]

Issue Date 16.

4. OTHER DETAILS

	YES	NO
PLANS ACCEPTABLE	☑	☐
RECOMMENDED FOR APPROVAL:	☑	☐

RECEIPT NO: 175280 DATE: 175280

5. REMARKS:

COMPLIANCE WITH DANGEROUS GOODS REGULATIONS AND IN PARTICULAR AS 1596.

Section 5.49.

6. PLACARDING REQUIRED:

HAZCHEM

2WE | F-Gas 2

OR CONTACT LOCAL OFFICE

CSS INSPECTOR: ..... DATE: .....

SENIOR CSS INSPECTOR: ..... DATE: 17.3.97

DETAILS OF PROPOSED STORAGE

...RRECT TECHNICAL NAME OF GOODS	UN No.	CLASS	SUB-RISK	PACKAGING GROUP	AMOUNT (kilolitres /tonnes)
LPG	1075	2.1	-	-	1.6 Kl

Issue Date 10/6/

TECHNICAL INFORMATION FOR SOME COMMON DANGEROUS GOO

CORRECT TECHNICAL NAME	UN No	CLASS	SUB-RISK	PACKAG GROU
ACETIC ACID SOLUTION (10-80% acid w/w)	2790	8	-	II
ACETONE	1090	3	-	II
ACETYLENE, DISSOLVED	1001	2.1	-	-
ARGON, COMPRESSED	1006	2.2	-	-
AEROSOLS (greater than 1 litre capacity)	1950	2.1 or 2.2	variable	-
AEROSOLS (less than 1 litre capacity)	1950	9	-	-
AMMONIA, ANHYDROUS, LIQUEFIED (greater than 50% ammonia)	1005	2.3	-	-
AMMONIUM NITRATE (common explosives grade)	1942	5.1	-	III
AMMONIUM NITRATE (common fertiliser grade)	2067	5.1	-	III
BATTERIES, WET, FILLED WITH ACID	2794	8	-	III
BATTERY FLUID, ACID	2796	8	-	II
CAUSTIC SODA - see SODIUM HYDROXIDE				
CARBON DIOXIDE	1013	2.2	-	-
CALCIUM HYPOCHLORITE, mixtures, dry	2208	5.1	-	II
CHLORINE	1017	2.3	5.1	-
DIESEL / DISTILLATE	-	3	-	-
ETHYL METHYL KETONE (MEK)	1193	3	-	II
HYDROCHLORIC ACID	1789	8	-	II
KEROSENE	1223	3	-	III
LIQUEFIED PETROLEUM GAS (LPG)	1075	2.1	-	-
NATURAL GAS, COMPRESSED	1971	2.1	-	-
NITRIC ACID (less than 70%)	2031	8	-	II
NITRIC ACID (greater than 70%, except red fuming)	2031	8	5.1	I
NITROGEN, COMPRESSED	1066	2.2	-	-
NITROUS OXIDE, COMPRESSED	1070	2.2	5.1	-
OXYGEN, COMPRESSED	1072	2.2	5.1	-
PETROL	1203	3	-	II
ROUNDUP - not dangerous goods	-	-	-	-
SODIUM CYANIDE	1689	6.1	-	I
SODIUM ETHYL XANTHATE	3134	4.3	6.1	III
SODIUM HYDROXIDE (solid)	1823	8	-	II
SODIUM HYPOCHLORITE (5% - 16% available chlorine)	1791	8	-	III
SODIUM NITRATE	1498	5.1	-	III
SULFUR (solid)	1350	4.1	-	III
SULFUR DIOXIDE, LIQUEFIED	1079	2.3	-	-
SULFURIC ACID (all concentrations except fuming and spent)	1830	8	-	II
TOLUENE	1294	3	-	II
TOLUENE DI-ISOCYANATE (TDI)	2078	6.1	-	II
TURPENTINE	1299	3	-	III
SPRAYSEED Herbicide	3016	6.1	-	III

DANGEROUS GOODS ACT 1976 AND REGULATIONS 1994

PLAN APPROVAL CHECKLIST

APPROVED TO DANGEROUS GOODS REGULATION NO. 52 (1) Approval of Depot 1994

REQUIREMENT	COMPLETED (Y/N)	COMMENTS
Plans in triplicate	Yes	
Scale not less than 1:250	Yes	
Correct fee paid	Yes	
Plan shows:		
• storage areas	Yes	
• tanks	Yes	cylinders
• loading / filling stations	Yes	
• pumps / pipelines	Yes	
• fire hydrants	Yes	
• elect. installations	Yes	
• roads	Yes	
• railways	N.A	
• magazines	N.A	
• buildings in depot	Yes	
D'Goods Manifest	Yes	
• quantity	Yes	
• class/s	Yes	
• UN NOs.	Yes	
• HAZCHEM placarding reqd.	Yes.	
Additional comments / recommendations		
Plans recommended for approval.		
Officer :		
Site no.: 2661		
Date: 15/4/97		

pcd/checkdoc

DANGEROUS GOODS INSPECTORATE

53922

001 Inspection

FILE REF. 2661
- 8 JAN 1996
EXCC. REF. 53922
OFFICER: CB | FOR ACTION: | FOR REPLY: 9/1
REFERRED TO | DATE

Inspection date 05 01 96 Inspector MR

Approval ☐ Follow up ☐ Routine ☐ New ☑

Approval date 11 09 95 Additional ☑

Approval No. 15548

Site No. 2661 Business Name: NORTH HOBART FOOT BALL CLUB

Zone MR01 Owner/Occupier:

Licence No. Site Address: ARGYLE ST

Type C Site City: NORTH HOBART Postcode

Location ☐ Supplier:

Debtor No. Debtor Name:

Debtor Address:

Debtor City: Postcode

Comments:

CODE	TYPE	SIZE	LICENCEABLE Y/N	UNIT	QUANTITY	LOCATION
LPG	CYLS	111	Y	KL	4	

DATA ENTRY

Add Site ☐ Increase Storage ☑ Date 09 01 96

Modify Site ☐ Reduce Storage ☐ User CBL

Cancel Site ☐ Routine ☐

FORM 4 (Regulation 36 (4))

TASMANIA

1548

Dangerous Goods Act 1976

Rec No. 161919

Approval of Site and Construction of Premises for Keeping Dangerous Goods or the Alteration of the Site and Construction of those Premises

GRANTED TO: [redacted] **Fee: $50**

Approval for the *alteration of the site and construction as shown on the approved plans and specifications of premises for the undermentioned dangerous goods, subject to the provisions of the Building Regulations and the Dangerous Goods Act 1976, being complied with and subject to the undermentioned special conditions, situated at:

North Hobart Football Club
Argyle Street
HOBART TAS 7000 Site: 2661

This approval is valid for a period of one year from the date of issue.

Date of issue: 11.9.95

.....
Chief Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
LPG	2.1	4 x .11 KL

SPECIAL CONDITIONS

Subject to : 1. Placarding of site.
2. All cylinders to be enclosed.

PLAN RECOMMENDATION REPORT

File No.: 2661 Inspector: M Robertson Date: 24-8-95

	Product	Quantity	Class
Proposal for:	LPG.	4 x 11 KL.	2.1

Business Name: North Hobart Football Club

Owner/Occupier:

Premises Address: Argyle Street, Hobart 7000

Correspondence Address (if different from above)

PLANS

Plans submitted by: [redacted]

Address: [redacted]

Receipt No.: 161979 Date: 24-8-95

Quality of plans acceptable: YES ☑ NO ☐

Suitable for approval: YES ☑ NO ☐

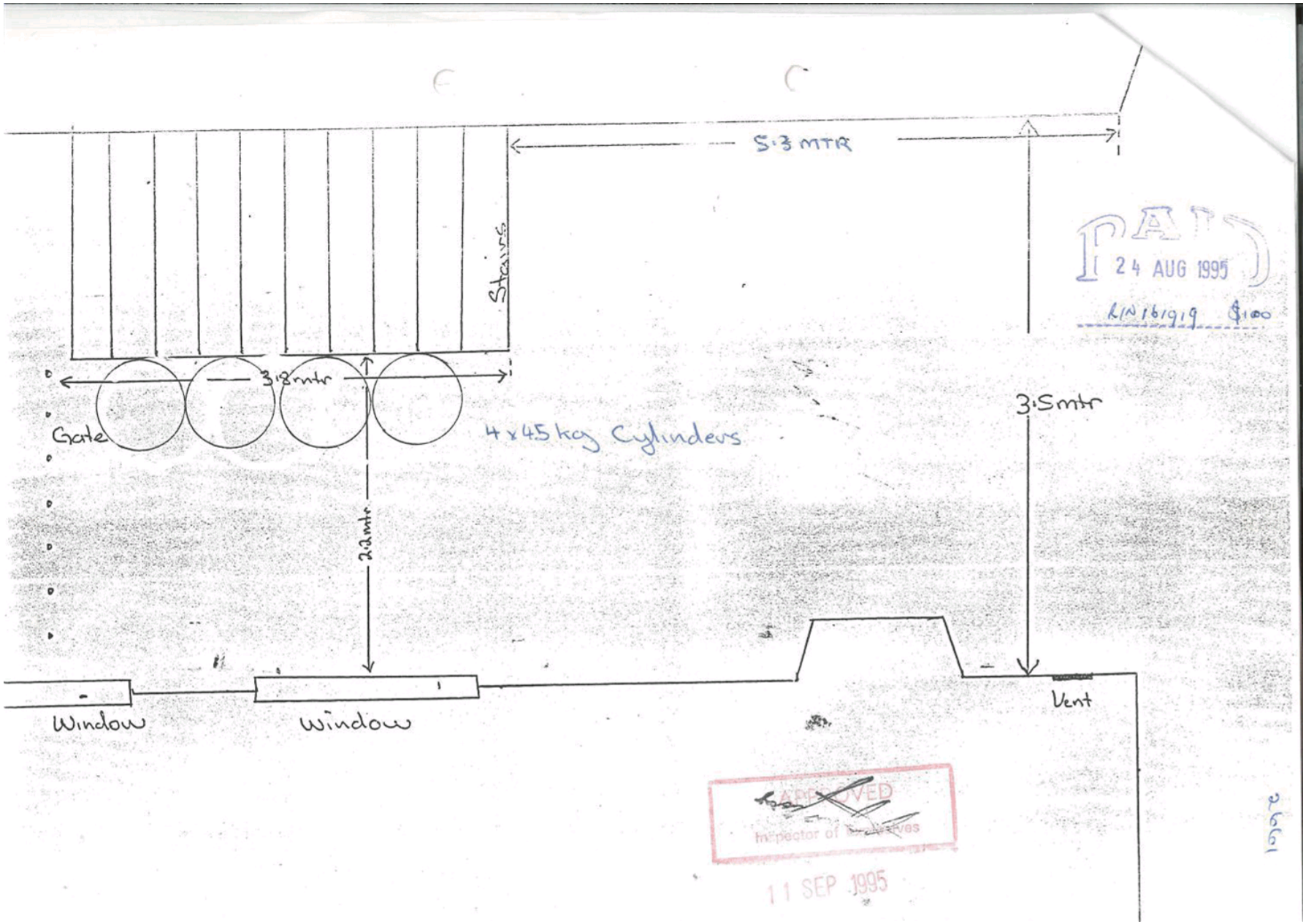
The above plans were checked, and the site inspected. The following is recommended:

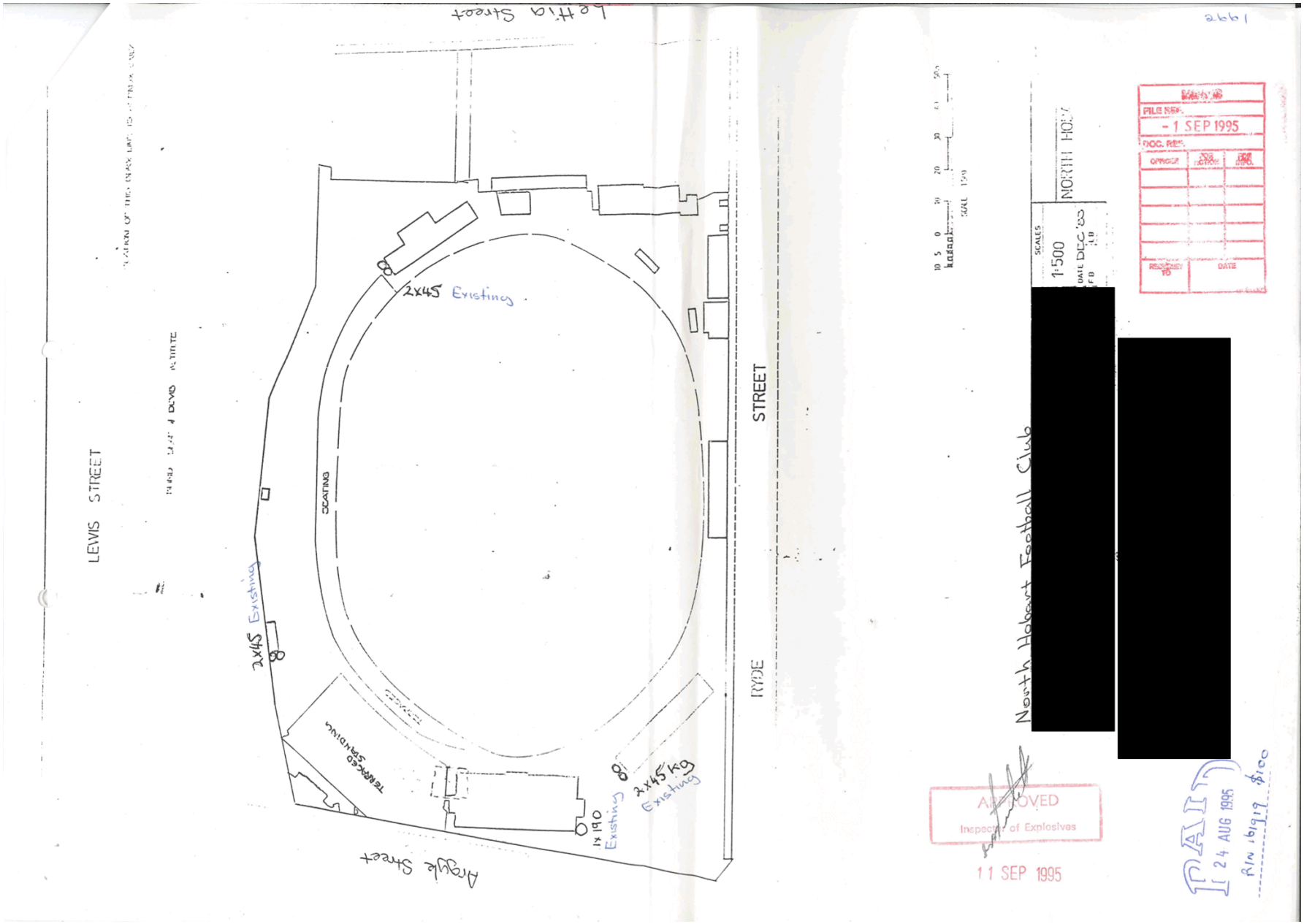
Remarks: SUBJECT TO 1. PLACARDING OF SITE.
2. ALL CYLINDERS TO BE ENCLOSED.

APPROVED

Inspector of Explosives: Date:

Senior Inspector of Explosives: Date:


5.3 MTR
Stairs
3.8mtr
Gate
4 x 45 kg Cylinders
3.5mtr
2.2mtr
Window
Window
Vent
PAID
24 AUG 1995
R/N 16/9/19 $100
APPROVED
Inspector of Explosives
11 SEP 1995


LEVIS STREET
RYDE STREET
Argyle Street
SEATING
2x45 Existing
2x45 Existing
2x45 Kg Existing
1x190 Existing
North Hobart Football Club
SCALES
1:500
DATE DEC '93
NORTH HOBART
- 1 SEP 1995
APPROVED
Inspector of Explosives
11 SEP 1995
24 AUG 1995
$100

Hobart City Council

Subject: RE: Potentially Contaminated Land Code - 1-5 Ryde Street, North Hobart

From: Salter, Simone - To: alex@enviromac.com.au - Date: 30 August 2018 at 8:38 AM, Attachments: image001.jpg image002.jpg

Hi Alex

Our records indicate the following:

1. An old brickworks site on the property adjacent to and identified the contaminant as a landfill. The address is 393 Argyle Street, North Hobart that has been identified with above, the operation was in place between 1816-1850s.
2. At 44 Ryde Street we have listed, but a note to delete from the register.

I hope this helps.

Thanks
Simone

Simone Salter | Senior Environmental Health Officer | Environmental Health
6238 2738

From: Alex Lovibond [mailto:alex@enviromac.com.au]
Sent: Tuesday, 28 August 2018 5:17 PM
To: Records Unit <RecordsUnit@hobartcity.com.au>
Cc: Simon Chislett <simonc@enviromac.com.au>
Subject: Potentially Contaminated Land Code - 1-5 Ryde Street, North Hobart

Good Afternoon HCC.

Att: Environmental Health Unit

EM&C have been engaged by *The North Hobart Football Club* to provide an Environmental Site Assessment to support their upcoming an application for development on potentially contaminated land.
Our client intends to construct a new building along the northern edge of the North Hobart Oval, and have identified to us that either the land intended for development, or the surrounding land may be classified as *potentially contaminated* based on the definition supplied within the HCC interim planning scheme.
The land intended for development is:
NORTH HOBART OVAL & BOWLS CLUB' - 1-5 RYDE ST NORTH HOBART TAS 7000
PID: 2003969
Title reference 119922/1

As the land has been identified by our client to us as potentially contaminated land, can you please disclose the activities carried out on the land in question, or in the instance where the potentially contaminating activity occurred on a neighbouring parcel of land, can you please give me the address/PIDs/title numbers along with the relevant activities carried out, such as the ones listed in table E2.2 within the planning scheme.

The reason I'm after this information is because the historical industries that have caused the land to become contaminated in the first place will impact the nature of our assessment, as it will guide us to what contaminants we should be testing for.

As I understand it, local councils have access to an overlay of potentially contaminated sites within the list, is it possible for me to access this overlay, or could you please provide me a screenshot of the local area with the potentially contaminating activities or affected areas of land highlighted?

Happy to have a chat with you further over the phone if you like,

Many thanks
Al

Alex Lovibond
Senior Environmental Scientist

Environmental Management & Consulting Pty Ltd
P. 03 6231 5979
M. 0439 306 677
E. alex@enviromac.com.au

Follow EM&C on LinkedIn
Follow me on LinkedIn

Tasmanian EPA

PROPERTY INFORMATION REQUEST FORM

To: Contaminated Sites Unit

Email: contaminatedsites@epa.tas.gov.au
Post: GPO Box 1550, HOBART TAS 7001

Minimum information required for a database search

Street number & name:	1-5 Ryde Street	Current Landowner :	Hobart City Council
Suburb / Town:	North Hobart	Current Site use:	Sporting Ground
Post code:	7000	Current Site operator:	North Hobart Football Club

Land title information (please specify Certificate of Title(s) and Property Identification number(s)):

Property ID: 2003969 Title Reference: 119922/1

Further information Potentially Contaminating Activities (PCA)

Current PCA on Site: Nil	Current PCA on surrounding land: Unknown
Past PCA on Site: Unknown	Past PCA on surrounding land: Brickworks (393 Argyle Street)
Names of Past operator (s) of Site: Unknown	Names of Past operator(s) of surrounding PCAs Unknown

Additional notes / comments

Identification of past PCA on surrounding land was communicated to EM&C over the phone by Hobart City Council. Awaiting confirmation in writing.

APPLICANT'S DETAILS INVOICE DETAILS

Company Name	Environmental Management & Consulting	**P.O or File reference**	EMC1866
Report recipient:	Alex Lovibond	**Invoice recipient:**	Environmental Management & Consulting
Email address:	alex@enviromac.com.au	Email address:	alex@enviromac.com.au
phone	03 6231 5979	Phone	03 6231 5979

Mailing address for report :

Payment The charge for this service is $237.00. An invoice will be sent on completion of the search.

N.B. Fee increases occur on 1 July every year.

Applicant's Signature.....

Date..29/8/18.....

Level 7, 134 Macquarie Street, Hobart TAS
GPO Box 1550, Hobart, TAS 7001 Australia

Enquiries: Contaminated Sites Unit
Phone: (03) 6165 4599
Email: contaminatedsites@epa.tas.gov.au
Web: www.epa.tas.gov.au
Our Ref: (EN-EM-AV-100706_38: H946191) sma

ENVIRONMENT PROTECTION AUTHORITY

21 September 2018

Mr Alex Lovibond
Environmental Management and Consulting
Level 2, 67 Letitia Street
NORTH HOBART TAS 7002

Dear Mr Lovibond

PROPERTY INFORMATION REQUEST
1-5 Ryde Street, North Hobart
PID 2003969

On 29 August 2018, the Contaminated Sites Unit received your Property Information Request relating to the land referred to above ('the Site'). A search of relevant databases and records has been undertaken.

No records relating to contamination or potentially contaminating activities on the Site were found.

EPA Tasmania received enquiries regarding redevelopment of 31 Federal Street (2016) and 393 Argyle Street (1998); Hobart City Council may have records relevant to your enquiry.

WorkSafe Tasmania [WST] records indicate that dangerous goods have been stored in underground storage tanks [UST] at several properties with 150m of the boundaries of the Site

• 27-29 Federal Street	1963-1985	WST File	K204
• 31 Federal Street	1972-1986	WST file	H631
• 37-41 Federal Street	1986	WST File	IS67155 vol 14
• 49a-53 Federal Street	1974-1977	WST File	S534
• 396 Argyle St (Unit 1&2)	1972-1984	WST File	R286

No other records relating to contamination or potentially contaminating activities at the Site or adjacent properties were found.

The search of records is restricted to those held by EPA Tasmania and includes records relating to: The *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010;* Industrial Sites (which are or have been regulated by EPA Tasmania); historical landfills; and contamination issues reported to the Contaminated Sites Unit. In addition, the Incidents and Complaints database and records relating to the historical storage of dangerous goods (as detailed below) are searched.

WorkSafe Tasmania (1300 366 322 or wstinfo@justice.tas.gov.au) may have issued dangerous goods licences and/or may hold relevant records for the Site and adjoining properties. As the storage of dangerous goods/fuels is an environmentally relevant activity, you may wish to contact them for further information.

Please note that the dangerous goods licensing records referred to by EPA Tasmania are for sites with underground storage tanks that ceased holding Dangerous Goods Licences prior to 1993. WorkSafe Tasmania hold the records for these Licences after 1993.

EPA Tasmania does not hold records on all sites that are or may be contaminated. You should consider obtaining a site history to determine the likelihood of contamination. If contamination on the Site or an adjacent property is considered likely, further assessment by a competent environmental assessment practitioner is recommended. Site assessments should be conducted in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, National Environment Protection Council (or as varied). http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/contaminated-site-assessment

Please note since 1 July 2015, the Director has required all environmental site assessments and reports submitted to the Contaminated Sites Unit for consideration to be prepared by a person certified as a specialist contaminated sites consultant under a scheme approved by the Director.
Effective 30 June 2018, the endorsed scheme is operated by Certified Environmental Practitioners (CEnvP): Consultants certified under this scheme are approved to use the seal **CEnvP Site Contamination**. https://www.cenvp.org.

Further details are available at http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/engaging-a-contaminated-site-assessment-consultant.

As local councils are able to issue Environment Protection Notices, Environmental Infringement Notices and record complaints, you may wish to contact them for additional information that may be relevant to the site. Further, if the Site has historically been subject to a permit under the *Land Use Planning and Approvals Act 1993*, the Council would have issued the permit.

Under the *Right to Information Act 2009* (RTI Act), you are entitled to apply for any records mentioned within this letter such as reports, letters, or other relevant documents. For further information on how the RTI process works and how to request information under the RTI Act please visit the Department of Primary Industries, Parks, Water and Environment website.

If you are purchasing a property, you should consider Part 5A of the *Environmental Management and Pollution Control Act 1994* (EMPCA) which defines and specifies requirements for managing contaminated sites. If there is reason to believe the site is, or is likely to be, contaminated there are certain requirements that you must meet (e.g. notification of a likely contaminated site to the Director, EPA as outlined in section 74B of the EMPCA).

Although all due care has been taken in the preparation of this letter, the Crown gives no warranty, express or implied, as to the accuracy or completeness of the information provided. The Crown and its servants or agents accept no responsibility for any loss or damage arising from reliance upon this letter, and any person relying on the letter does so at their own risk absolutely.

As you are aware, property searches incur a charge of $237.00. An invoice is enclosed.

If you have any queries in relation to the matters above, please contact the Contaminated Sites Unit using the details at the head of this correspondence or refer to the EPA website at www.epa.tas.gov.au and click on 'Regulation to locate information on Underground Fuel Tanks and Contaminated Sites.

Yours sincerely

Bruce Napier
ENVIRONMENTAL OFFICER - CONTAMINATED SITES

Email: alex@enviromac.com.au

Attachment: Invoice

APPENDIX C

Laboratory Certificates of Analysis

Chain of Custody and Analysis Request Page : 1 of 1

Site Name: North Hobart Oval	Client : Environmental Management and Consulting Pty Ltd	Primary Laboratory	Secondary Laboratory
Project Number: EMC1866	Quote Number: MEBQ/117/16	ALS Laboratory Group	Eurofins MGT
Sampled By: Alex Lovibond	Project Manager : Alex Lovibond	2-4 Westall Rd	2-5 Kingston Town Close
Phone : 0439 306 677	Phone : 0439 306 677	Springvale, VIC, 3171	Oakleigh, VIC, 3168
	INVOICES TO: admin@enviromac.com.au	Phone : 03) 85499600	Phone : 03) 9564 7055

em&c

RESULTS : Results Required By: Same day (Additional fee +100%) 24hrs +40% 48hrs +20% 3 days +10% 5 days other: _____

Please ensure all samples are analysed within the same QC lot

Send Results & Copy of COC to:

Simon Chilsett	Alex Lovibond	Tom Latham
Email: simon@enviromac.con	Email: alex@enviromac.com.	Email: Tom@enviromac.com.au
Phone: 0428 288 258	Phone: 0439 306 677	Phone: 0488 515 991

Laboaratory Rinsate Water VOC, BATCH: EM1709310
Laboaratory Rinsate Water sVOC, BATCH: 5/07/18
Laboaratory Prepared Trip Blank, BATCH: EM1714628

Laboratory Sample ID	Field Sample ID	Date Collected	Sample Type		Preservation Method			Type & Number of Containers		Analyses Required									COMMENTS (Mention if samples are for QC/MS, Filtered or Not)
			Soil	Water	Ice	Acid	None	Glass	Plastic	S-26 TRH (C6-C40)/BTEXN /PAH plus 8 metals	P-20 Tasmanian EPA Bulletin No. 105 (Soil) excluding TBT	P-22 NEPM Screen for Soil Classification: e, CEC, pH(CaCl), T C, Clay Content	W-4 - TPH/TRH (C6-C36 or 40)/BTEXN plus F1 & F2	S-4 TPH/TRH (C6-C36 or 40)/BTEXN, F1,F2					
1	RB_7/9/18	7/09/18		X	X	X		5					X						ADDITIONAL SVOC BOTTLES PROVIDED FOR INTERNAL LAB QA/QC
2	TB_7/9/18	7/09/18	X		X			1						X					
3	QCP_7/9/18	7/09/18	X		X			1						X					
4	SB1_0.2-0.3	7/09/18	X		X			1			X								
5	SB1_0.5-0.6	7/09/18	X		X			1		X									PLEASE LOWER LOR FOR B(a)P ANALYSIS TO SUIT TAS EPA WASTE GUIDELINES FOR EACH OF THESE SAMPLES.
6	SB2_0.2-0.3	7/09/18	X		X			1		X									PLEASE INCLUDE ALL OF THESE SAMPLES IN 1B105 COMPARISON TABLE
7	SB3_0.4-0.5	10/09/18	X		X			1		X									
8	SB4_0.2-0.3	7/09/18	X		X			1		X									
9	SB5_0.3-0.4	7/09/18	X		X			1		X									
10	SB1_1.0-1.1	7/09/18	X		X			1				X							
11	SB2_0.5-0.6	7/09/18	X		X			1		X									
12	SB3_0.9-1.0	10/09/18	X		X			1		X									
13	SB4_1.3-1.4	7/09/18	X		X			1		X									
14	SB5_0.5-0.6	7/09/18	X		X			1		X									

FREIGHT

Environmental Division
Melbourne
Work Order Reference
EM1814532

Telephone : + 61-3-8549 9600

Relinquished By: ALEX LOVIBOND Date 10/9/18	Couriered By: Date:	Received By: Date: 11/9/18
Signature: Time: 16:00	Signature: Time	Signature: Time: 10:55

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM1814532**		
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Contact	: Customer Services EM
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: alex@enviromac.com.au	E-mail	: MelbourneEnviroSer@alsglobal.com
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Facsimile	: +61 03 6231 5979	Facsimile	: +61-3-8549 9626
Project	: EMC1866	Page	: 1 of 3
Order number	:	Quote number	: EB2017ENVMANCON0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: North Hobart Oval		
Sampler	: ALEX LOVIBOND		

Dates

Date Samples Received	: 11-Sep-2018 10:55	Issue Date	: 11-Sep-2018
Client Requested Due Date	: 18-Sep-2018	Scheduled Reporting Date	: **18-Sep-2018**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.0°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Issue Date	: 11-Sep-2018
Page	: 2 of 3
Work Order	: EM1814532 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP075-TAS Benzo(a)pyrene - Waste Classification (TAS	SOIL - P-20/1 TAS EPA 105 (no TBT)	SOIL - P-22 (Melb) minus PSD Soil Characterisation Suite (minus PSD)	SOIL - S-04 TRH/BTEXN	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1814532-002	07-Sep-2018 00:00	TB_7/9/18	✓				✓	
EM1814532-003	07-Sep-2018 00:00	QCP_7/9/18	✓				✓	
EM1814532-004	07-Sep-2018 00:00	SB1_0.2-0.3	✓		✓			
EM1814532-005	07-Sep-2018 00:00	SB1_0.5-0.6	✓	✓				✓
EM1814532-006	07-Sep-2018 00:00	SB2_0.2-0.3	✓	✓				✓
EM1814532-007	10-Sep-2018 00:00	SB3_0.4-0.5	✓	✓				✓
EM1814532-008	07-Sep-2018 00:00	SB4_0.2-0.3	✓	✓				✓
EM1814532-009	07-Sep-2018 00:00	SB5_0.3-0.4	✓	✓				✓
EM1814532-010	07-Sep-2018 00:00	SB1_1.0-1.1	✓			✓		
EM1814532-011	07-Sep-2018 00:00	SB2_0.5-0.6	✓					✓
EM1814532-012	10-Sep-2018 00:00	SB3_0.9-1.0	✓					✓
EM1814532-013	07-Sep-2018 00:00	SB4_1.3-1.4	✓					✓
EM1814532-014	07-Sep-2018 00:00	SB5_0.5-0.6	✓					✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-04 TRH/BTEXN
EM1814532-001	07-Sep-2018 00:00	RB_7/9/18	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Issue Date	: 11-Sep-2018
Page	: 3 of 3
Work Order	: EM1814532 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Requested Deliverables

ALEX LOVIBOND

- *AU Certificate of Analysis - NATA (COA)	Email	alex@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	alex@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	alex@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	alex@enviromac.com.au
- EPA Waste Classification & Categorisation Guideline Report (COA_GL_EPA_WASTE)	Email	alex@enviromac.com.au

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	admin@enviromac.com.au

SIMON CHISLETT

- *AU Certificate of Analysis - NATA (COA)	Email	simon@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	simon@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	simon@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	simon@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	simon@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	simon@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	simon@enviromac.com.au
- EPA Waste Classification & Categorisation Guideline Report (COA_GL_EPA_WASTE)	Email	simon@enviromac.com.au

TOM LATHAM

- *AU Certificate of Analysis - NATA (COA)	Email	tom@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tom@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	tom@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	tom@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	tom@enviromac.com.au
- EPA Waste Classification & Categorisation Guideline Report (COA_GL_EPA_WASTE)	Email	tom@enviromac.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1814532**	Page	: 1 of 14
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Contact	: Customer Services EM
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Project	: EMC1866	Date Samples Received	: 11-Sep-2018 10:55
Order number	:	Date Analysis Commenced	: 11-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018 11:15
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Poor duplicate precision observed for sample EM1814532-004. Confirm sample heterogeneity via re-extraction and re-analysis
- pH analysis is done under non-stirring condition.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- (EP071): (EM1814515_004) Poor duplicate precision observed due to sample heterogeneity. Insufficient sample remains to confirm sample heterogeneity via re-extraction and re-analysis
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	13.1	12.5	16.2	13.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	----	<5	<5	<5
Barium	7440-39-3	10	mg/kg		----	----	80	----	----
Beryllium	7440-41-7	1	mg/kg		----	----	<1	----	----
Cadmium	7440-43-9	1	mg/kg		----	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		----	----	7	11	6
Cobalt	7440-48-4	2	mg/kg		----	----	13	----	----
Copper	7440-50-8	5	mg/kg		----	----	73	31	82
Lead	7439-92-1	5	mg/kg		----	----	90	35	28
Manganese	7439-96-5	5	mg/kg		----	----	909	----	----
Molybdenum	7439-98-7	2	mg/kg		----	----	<2	----	----
Nickel	7440-02-0	2	mg/kg		----	----	13	18	15
Selenium	7782-49-2	5	mg/kg		----	----	<5	----	----
Silver	7440-22-4	2	mg/kg		----	----	<2	----	----
Tin	7440-31-5	5	mg/kg		----	----	25	----	----
Zinc	7440-66-6	5	mg/kg		----	----	112	27	57
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)									
Hexavalent Chromium	18540-29-9	0.5	mg/kg		----	----	<0.5	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	1	mg/kg		----	----	<1	----	----
EK040T: Fluoride Total									
Fluoride	16984-48-8	40	mg/kg		----	----	120	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	<0.05	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Aldrin	309-00-2	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	<0.05	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	----	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	----	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg		----	----	<2	----	----
^ Sum of Phenols	----	0.5	mg/kg		----	----	<0.5	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Naphthalene	91-20-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	----	2.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	----	0.7	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	----	4.9	<0.5	1.7
Pyrene	129-00-0	0.5	mg/kg		----	----	4.9	<0.5	1.8
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	2.3	<0.5	0.9
Chrysene	218-01-9	0.5	mg/kg		----	----	2.3	<0.5	0.8
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	2.8	<0.5	1.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	1.1	<0.5	0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	1.7	<0.5	0.8
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	2.0	<0.5	1.2
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	27.9	<0.5	10.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	3.5	<0.5	1.7
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	3.8	0.6	1.9
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	4.0	1.2	2.2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		----	----	2.97	0.08	2.21
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	280	210	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	280	210	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	330	280	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	330	280	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	77.5	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	84.9	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	86.7	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	92.1	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	89.6	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	76.2	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	99.3	97.6	90.3
Anthracene-d10	1719-06-8	0.5	%		----	----	107	100.0	99.4
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	103	95.2	95.6
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		----	----	119	101	95.3
Anthracene-d10	1719-06-8	0.025	%		----	----	116	98.2	93.8
4-Terphenyl-d14	1718-51-0	0.025	%		----	----	115	95.6	90.3
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		78.8	74.2	78.3	77.9	76.8

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		79.3	77.7	79.0	83.4	76.4
4-Bromofluorobenzene	460-00-4	0.2	%		90.9	88.5	89.8	93.0	87.6

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	SB3_0.4-0.5	SB4_0.2-0.3	SB5_0.3-0.4	SB1_1.0-1.1	SB2_0.5-0.6
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-007	EM1814532-008	EM1814532-009	EM1814532-010	EM1814532-011
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		----	----	----	6.4	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		8.7	5.8	10.8	13.8	14.2
ED006: Exchangeable Cations on Alkaline Soils									
ø Exchangeable Calcium	----	0.2	meq/100g		----	----	----	11.5	----
ø Exchangeable Magnesium	----	0.2	meq/100g		----	----	----	4.1	----
ø Exchangeable Potassium	----	0.2	meq/100g		----	----	----	0.8	----
ø Exchangeable Sodium	----	0.2	meq/100g		----	----	----	0.3	----
ø Cation Exchange Capacity	----	0.2	meq/100g		----	----	----	16.7	----
ø Exchangeable Calcium Percent	----	0.2	%		----	----	----	68.9	----
ø Exchangeable Magnesium Percent	----	0.2	%		----	----	----	24.6	----
ø Exchangeable Potassium Percent	----	0.2	%		----	----	----	4.7	----
ø Exchangeable Sodium Percent	----	0.2	%		----	----	----	1.7	----
ø Calcium/Magnesium Ratio	----	0.2	-		----	----	----	2.8	----
ø Magnesium/Potassium Ratio	----	0.2	-		----	----	----	5.2	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	----	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg		20	<2	7	----	13
Copper	7440-50-8	5	mg/kg		42	92	60	----	32
Iron	7439-89-6	0.005	%		----	----	----	3.86	----
Lead	7439-92-1	5	mg/kg		26	<5	49	----	28
Nickel	7440-02-0	2	mg/kg		16	9	12	----	12
Zinc	7440-66-6	5	mg/kg		49	32	79	----	60
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	----	1.7	----
Total Organic Carbon	----	0.5	%		----	----	----	1.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	0.6	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5

Page : 9 of 14
Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB3_0.4-0.5	SB4_0.2-0.3	SB5_0.3-0.4	SB1_1.0-1.1	SB2_0.5-0.6
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-007	EM1814532-008	EM1814532-009	EM1814532-010	EM1814532-011
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	1.4	----	0.8
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		0.7	<0.5	3.8	----	0.9
Pyrene	129-00-0	0.5	mg/kg		0.7	<0.5	4.1	----	0.8
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	1.6	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	1.4	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	3.1	----	0.7
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	1.1	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	2.0	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	2.9	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		1.4	<0.5	24.9	----	3.2
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	3.7	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	4.0	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	4.2	----	1.2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		0.60	<0.05	2.72	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	140	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	140	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	<50

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB3_0.4-0.5	SB4_0.2-0.3	SB5_0.3-0.4	SB1_1.0-1.1	SB2_0.5-0.6
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-007	EM1814532-008	EM1814532-009	EM1814532-010	EM1814532-011
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	<1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.1	85.0	92.3	----	86.0
Anthracene-d10	1719-06-8	0.5	%		96.6	95.3	93.0	----	81.1
4-Terphenyl-d14	1718-51-0	0.5	%		92.2	89.8	88.3	----	89.7
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		105	95.2	96.8	----	----
Anthracene-d10	1719-06-8	0.025	%		102	95.1	95.4	----	----
4-Terphenyl-d14	1718-51-0	0.025	%		97.9	92.8	90.2	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		77.2	76.1	71.8	----	76.5
Toluene-D8	2037-26-5	0.2	%		76.9	73.1	67.8	----	64.1
4-Bromofluorobenzene	460-00-4	0.2	%		89.9	91.4	83.0	----	62.5

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB3_0.9-1.0	SB4_1.3-1.4	SB5_0.5-0.6	----	----
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		EM1814532-012	EM1814532-013	EM1814532-014	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		13.3	15.7	12.9	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		15	5	10	----	----
Copper	7440-50-8	5	mg/kg		90	12	73	----	----
Lead	7439-92-1	5	mg/kg		158	42	76	----	----
Nickel	7440-02-0	2	mg/kg		18	5	12	----	----
Zinc	7440-66-6	5	mg/kg		114	96	132	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		4.6	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		0.9	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		6.4	0.6	0.9	----	----
Pyrene	129-00-0	0.5	mg/kg		5.9	0.6	0.9	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		1.9	<0.5	0.6	----	----
Chrysene	218-01-9	0.5	mg/kg		1.7	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		2.4	0.6	0.8	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		0.8	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		2.1	<0.5	0.7	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		1.1	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		1.6	<0.5	0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		29.4	1.8	4.4	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		2.8	<0.5	0.8	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		3.0	0.6	1.1	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		3.2	1.2	1.4	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB3_0.9-1.0	SB4_1.3-1.4	SB5_0.5-0.6	----	----
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		EM1814532-012	EM1814532-013	EM1814532-014	---------	---------
					Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		120	<100	100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		120	<50	100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.0	88.4	94.8	----	----
Anthracene-d10	1719-06-8	0.5	%		95.9	97.8	96.0	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		92.6	94.4	90.5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		75.4	71.9	75.5	----	----
Toluene-D8	2037-26-5	0.2	%		70.2	71.1	70.6	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		87.8	84.8	85.2	----	----

Page : 13 of 14
Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	RB_7/9/18	----	----	----	----
			Client sampling date / time	07-Sep-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1814532-001	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	90.0	----	----	----	----
Toluene-D8	2037-26-5	2	%	78.5	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	97.7	----	----	----	----

Page : 14 of 14
Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

ALS Environmental

Automated Guideline Comparison Report

EPA Tasmania Information Bulletin No. 105 - Table 2: Soil Hazard Categorisation

Work Order	: **EM1814532**	Page	: 1 of 14
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND		
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: alex@enviromac.com.au	E-mail	: MelbourneEnviroSer@alsglobal.com
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Facsimile	: +61 03 6231 5979	Facsimile	: +61-3-8549 9626
Project	: EMC1866	Date Received	: 11-Sep-2018 10:55
Order number	:	Date Analysed	: 11-Sep-2018
C-O-C number	: ----	Date Issued	: 17-Sep-2018 11:15
No. of samples received	: 14		
No. of samples analysed	: 14	Quote number	: EN/222

General Comments

This guideline comparison report **only** provides evaluation of total concentration data against upper limit thresholds for the 'Fill Material', 'Low Level Contaminated Soil', and 'Contaminated Soil' categories in Table 2 of EPA Tasmania Information Bulletin No. 105.

This guideline comparison report is **NOT** a soil classification report. Classification of soils requires consideration of a number of other factors including preliminary site investigation, sampling density and statistical calculations.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

This guideline comparison report only provides evaluation data where chemical parameters specifically listed within Table 2 of EPA Tasmania Information Bulletin No. 105 are analysed by ALS using the **P-20/1 package in full**. P-20/1 package does not include Tributyltin.

Red shading is applied where the result is equal to or greater than the guideline upper limit and/or equal to or lower than the guideline lower limit. Red shading is not applied to the 'Summary of Thresholds Reached or Exceeded'.

For the 'Summary of Thresholds Reached or Exceeded' to accurately function, all samples must be analysed and included in the 'Analytical Results' section of the following report. Please verify that all required IDs are listed and analysed.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Summary of Thresholds Reached or Exceeded

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Fill Material - Level 1

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
SB1_0.2-0.3	**EM1814532-004**	Manganese	EG005T	5	*< 500 mg/kg*	**909 mg/kg**
SB1_0.2-0.3	**EM1814532-004**	Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	*< 20 mg/kg*	**27.9 mg/kg**
SB1_0.2-0.3	**EM1814532-004**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**2.97 mg/kg**
SB1_0.5-0.6	**EM1814532-005**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**0.08 mg/kg**
SB2_0.2-0.3	**EM1814532-006**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**2.21 mg/kg**
SB3_0.4-0.5	**EM1814532-007**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**0.60 mg/kg**
SB5_0.3-0.4	**EM1814532-009**	Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	*< 20 mg/kg*	**24.9 mg/kg**
SB5_0.3-0.4	**EM1814532-009**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**2.72 mg/kg**

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
SB1_0.2-0.3	**EM1814532-004**	Benzo(a)pyrene	EP075-TAS	0.05	*< 2 mg/kg*	**2.97 mg/kg**
SB2_0.2-0.3	**EM1814532-006**	Benzo(a)pyrene	EP075-TAS	0.05	*< 2 mg/kg*	**2.21 mg/kg**
SB5_0.3-0.4	**EM1814532-009**	Benzo(a)pyrene	EP075-TAS	0.05	*< 2 mg/kg*	**2.72 mg/kg**

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Analytical Results

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	SB1_0.2-0.3 07-Sep-2018 15:00 EM1814532-004	SB1_0.5-0.6 07-Sep-2018 15:00 EM1814532-005	SB2_0.2-0.3 07-Sep-2018 15:00 EM1814532-006	SB3_0.4-0.5 10-Sep-2018 15:00 EM1814532-007	SB4_0.2-0.3 07-Sep-2018 15:00 EM1814532-008
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	mg/kg	----	750	<5	<5	<5	<5	<5
Barium	EG005T	10	mg/kg	----	30000	**80**	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	400	<1	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	400	<1	<1	<1	<1	<1
Chromium	EG005T	2	mg/kg	----	5000	**7**	**11**	**6**	**20**	<2
Cobalt	EG005T	2	mg/kg	----	1000	**13**	----	----	----	----
Copper	EG005T	5	mg/kg	----	7500	**73**	**31**	**82**	**42**	**92**
Lead	EG005T	5	mg/kg	----	3000	**90**	**35**	**28**	**26**	<5
Manganese	EG005T	5	mg/kg	----	25000	**909**	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	4000	<2	----	----	----	----
Nickel	EG005T	2	mg/kg	----	3000	**13**	**18**	**15**	**16**	**9**
Selenium	EG005T	5	mg/kg	----	200	<5	----	----	----	----
Silver	EG005T	2	mg/kg	----	720	<2	----	----	----	----
Tin	EG005T	5	mg/kg	----	900	**25**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	50000	**112**	**27**	**57**	**49**	**32**
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	110	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	2000	<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	2500	<1	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	10000	**120**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	50	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	50	<0.05	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	1000	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	2000	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	200	**27.9**	<0.5	**10.5**	**1.4**	<0.5

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	SB1_0.2-0.3 07-Sep-2018 15:00 EM1814532-004	SB1_0.5-0.6 07-Sep-2018 15:00 EM1814532-005	SB2_0.2-0.3 07-Sep-2018 15:00 EM1814532-006	SB3_0.4-0.5 10-Sep-2018 15:00 EM1814532-007	SB4_0.2-0.3 07-Sep-2018 15:00 EM1814532-008
EP075B: Polynuclear Aromatic Hydrocarbons										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	20	**2.97**	**0.08**	**2.21**	**0.60**	<0.05
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	1000	<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	10000	**210**	<50	<50	<50	<50
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	50	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	1000	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	1080	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	1800	<0.5	<0.5	<0.5	<0.5	<0.5

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	SB1_0.2-0.3 07-Sep-2018 15:00 EM1814532-004	SB1_0.5-0.6 07-Sep-2018 15:00 EM1814532-005	SB2_0.2-0.3 07-Sep-2018 15:00 EM1814532-006	SB3_0.4-0.5 10-Sep-2018 15:00 EM1814532-007	SB4_0.2-0.3 07-Sep-2018 15:00 EM1814532-008
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	mg/kg	----	20	<5	<5	<5	<5	<5
Barium	EG005T	10	mg/kg	----	300	**80**	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	2	<1	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	3	<1	<1	<1	<1	<1
Chromium	EG005T	2	mg/kg	----	50	**7**	**11**	**6**	**20**	<2
Cobalt	EG005T	2	mg/kg	----	100	**13**	----	----	----	----
Copper	EG005T	5	mg/kg	----	100	**73**	**31**	**82**	**42**	**92**
Lead	EG005T	5	mg/kg	----	300	**90**	**35**	**28**	**26**	<5
Manganese	EG005T	5	mg/kg	----	500	**909**	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	10	<2	----	----	----	----
Nickel	EG005T	2	mg/kg	----	60	**13**	**18**	**15**	**16**	**9**
Selenium	EG005T	5	mg/kg	----	10	<5	----	----	----	----
Silver	EG005T	2	mg/kg	----	10	<2	----	----	----	----
Tin	EG005T	5	mg/kg	----	50	**25**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	200	**112**	**27**	**57**	**49**	**32**
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	1	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	1	<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	32	<1	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	300	**120**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	2	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	2	<0.05	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	2	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	25	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	20	**27.9**	<0.5	**10.5**	**1.4**	<0.5
EP075B: Polynuclear Aromatic Hydrocarbons										

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	Client sample ID: SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3	SB3_0.4-0.5	SB4_0.2-0.3
						Sampling date/time: 07-Sep-2018 15:00	07-Sep-2018 15:00	07-Sep-2018 15:00	10-Sep-2018 15:00	07-Sep-2018 15:00
						EM1814532-004	EM1814532-005	EM1814532-006	EM1814532-007	EM1814532-008
EP075B: Polynuclear Aromatic Hydrocarbons - Continued										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	0.08	**2.97**	**0.08**	**2.21**	**0.60**	<0.05
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	65	<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	1000	**210**	<50	<50	<50	<50
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	1	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	1	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	3	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	14	<0.5	<0.5	<0.5	<0.5	<0.5

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	SB1_0.2-0.3 07-Sep-2018 15:00 EM1814532-004	SB1_0.5-0.6 07-Sep-2018 15:00 EM1814532-005	SB2_0.2-0.3 07-Sep-2018 15:00 EM1814532-006	SB3_0.4-0.5 10-Sep-2018 15:00 EM1814532-007	SB4_0.2-0.3 07-Sep-2018 15:00 EM1814532-008
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	mg/kg	----	200	<5	<5	<5	<5	<5
Barium	EG005T	10	mg/kg	----	3000	**80**	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	40	<1	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	40	<1	<1	<1	<1	<1
Chromium	EG005T	2	mg/kg	----	500	**7**	**11**	**6**	**20**	<2
Cobalt	EG005T	2	mg/kg	----	200	**13**	----	----	----	----
Copper	EG005T	5	mg/kg	----	2000	**73**	**31**	**82**	**42**	**92**
Lead	EG005T	5	mg/kg	----	1200	**90**	**35**	**28**	**26**	<5
Manganese	EG005T	5	mg/kg	----	5000	**909**	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	1000	<2	----	----	----	----
Nickel	EG005T	2	mg/kg	----	600	**13**	**18**	**15**	**16**	**9**
Selenium	EG005T	5	mg/kg	----	50	<5	----	----	----	----
Silver	EG005T	2	mg/kg	----	180	<2	----	----	----	----
Tin	EG005T	5	mg/kg	----	500	**25**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	14000	**112**	**27**	**57**	**49**	**32**
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	30	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	200	<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	1000	<1	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	3000	**120**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	20	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	20	<0.05	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	200	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	500	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	40	**27.9**	<0.5	**10.5**	**1.4**	<0.5
EP075B: Polynuclear Aromatic Hydrocarbons										

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time* / Guideline Lower Limit	Guideline Upper Limit	**SB1_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-004**	**SB1_0.5-0.6** 07-Sep-2018 15:00 **EM1814532-005**	**SB2_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-006**	**SB3_0.4-0.5** 10-Sep-2018 15:00 **EM1814532-007**	**SB4_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-008**
EP075B: Polynuclear Aromatic Hydrocarbons - Continued										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	2	**2.97**	**0.08**	**2.21**	**0.60**	<0.05
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	650	<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	5000	**210**	<50	<50	<50	<50
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	5	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	100	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	100	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	180	<0.5	<0.5	<0.5	<0.5	<0.5

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Client sample ID / Sampling date/time	Guideline Lower Limit	Guideline Upper Limit	SB5_0.3-0.4 07-Sep-2018 15:00 EM1814532-009	---- ---- ----	---- ---- ----	---- ---- ----	---- ---- ----
EG005T: Total Metals by ICP-AES											
Barium	EG005T	10	mg/kg		----	----	----	----	----	----	----
Beryllium	EG005T	1	mg/kg		----	----	----	----	----	----	----
Cobalt	EG005T	2	mg/kg		----	----	----	----	----	----	----
Manganese	EG005T	5	mg/kg		----	----	----	----	----	----	----
Molybdenum	EG005T	2	mg/kg		----	----	----	----	----	----	----
Selenium	EG005T	5	mg/kg		----	----	----	----	----	----	----
Silver	EG005T	2	mg/kg		----	----	----	----	----	----	----
Tin	EG005T	5	mg/kg		----	----	----	----	----	----	----
Arsenic	EG005T	5	mg/kg		----	750	<5	----	----	----	----
Cadmium	EG005T	1	mg/kg		----	400	<1	----	----	----	----
Chromium	EG005T	2	mg/kg		----	5000	**7**	----	----	----	----
Copper	EG005T	5	mg/kg		----	7500	**60**	----	----	----	----
Lead	EG005T	5	mg/kg		----	3000	**49**	----	----	----	----
Nickel	EG005T	2	mg/kg		----	3000	**12**	----	----	----	----
Zinc	EG005T	5	mg/kg		----	50000	**79**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS											
Mercury	EG035T	0.1	mg/kg		----	110	<0.1	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)											
Hexavalent Chromium	EG048G	0.5	mg/kg		----	----	----	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser											
Total Cyanide	EK026SF	1	mg/kg		----	----	----	----	----	----	----
EK040T: Fluoride Total											
Fluoride	EK040T	40	mg/kg		----	----	----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)											
Total Polychlorinated biphenyls	EP066	0.1	mg/kg		----	----	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)											
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg		----	----	----	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg		----	----	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds											
Sum of Phenols	EP075(SIM)	0.5	mg/kg		----	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons											
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg		----	200	**24.9**	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons											

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Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time*	Guideline Lower Limit	Guideline Upper Limit	**SB5_0.3-0.4** 07-Sep-2018 15:00 EM1814532-009	---- ---- ---- ----	---- ---- ---- ----	---- ---- ---- ----	---- ---- ---- ----
EP075B: Polynuclear Aromatic Hydrocarbons - Continued											
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg		----	20	**2.72**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons											
C6 - C9 Fraction	EP080	10	mg/kg		----	1000	<10	----	----	----	----
C10 - C36 Fraction (sum)	EP071	50	mg/kg		----	10000	<50	----	----	----	----
EP080: BTEXN											
Benzene	EP080	0.2	mg/kg		----	50	<0.2	----	----	----	----
Toluene	EP080	0.5	mg/kg		----	1000	<0.5	----	----	----	----
Ethylbenzene	EP080	0.5	mg/kg		----	1080	<0.5	----	----	----	----
Total Xylenes	EP080	0.5	mg/kg		----	1800	<0.5	----	----	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	Client sample ID: SB5_0.3-0.4	----	----	----	----
				Sampling date/time		07-Sep-2018 15:00	----	----	----	----
						EM1814532-009	--------	--------	--------	--------
EG005T: Total Metals by ICP-AES										
Barium	EG005T	10	mg/kg	----	----	----	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	----	----	----	----	----	----
Cobalt	EG005T	2	mg/kg	----	----	----	----	----	----	----
Manganese	EG005T	5	mg/kg	----	----	----	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	----	----	----	----	----	----
Selenium	EG005T	5	mg/kg	----	----	----	----	----	----	----
Silver	EG005T	2	mg/kg	----	----	----	----	----	----	----
Tin	EG005T	5	mg/kg	----	----	----	----	----	----	----
Arsenic	EG005T	5	mg/kg	----	20	<5	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	3	<1	----	----	----	----
Chromium	EG005T	2	mg/kg	----	50	**7**	----	----	----	----
Copper	EG005T	5	mg/kg	----	100	**60**	----	----	----	----
Lead	EG005T	5	mg/kg	----	300	**49**	----	----	----	----
Nickel	EG005T	2	mg/kg	----	60	**12**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	200	**79**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	1	<0.1	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	----	----	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	----	----	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	----	----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	----	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	----	----	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	----	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	20	**24.9**	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons										

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	Guideline Lower Limit	Guideline Upper Limit	*Client sample ID* / *Sampling date/time*				
						SB5_0.3-0.4	----	----	----	----
						07-Sep-2018 15:00	----	----	----	----
						EM1814532-009	--------	--------	--------	--------
EP075B: Polynuclear Aromatic Hydrocarbons - Continued										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	0.08	**2.72**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	65	<10	----	----	----	----
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	1000	<50	----	----	----	----
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	1	<0.2	----	----	----	----
Toluene	EP080	0.5	mg/kg	----	1	<0.5	----	----	----	----
Ethylbenzene	EP080	0.5	mg/kg	----	3	<0.5	----	----	----	----
Total Xylenes	EP080	0.5	mg/kg	----	14	<0.5	----	----	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time* / Guideline Lower Limit	Guideline Upper Limit	**SB5_0.3-0.4** / 07-Sep-2018 15:00 / EM1814532-009	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------
EG005T: Total Metals by ICP-AES										
Barium	EG005T	10	mg/kg	----	----	----	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	----	----	----	----	----	----
Cobalt	EG005T	2	mg/kg	----	----	----	----	----	----	----
Manganese	EG005T	5	mg/kg	----	----	----	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	----	----	----	----	----	----
Selenium	EG005T	5	mg/kg	----	----	----	----	----	----	----
Silver	EG005T	2	mg/kg	----	----	----	----	----	----	----
Tin	EG005T	5	mg/kg	----	----	----	----	----	----	----
Arsenic	EG005T	5	mg/kg	----	200	<5	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	40	<1	----	----	----	----
Chromium	EG005T	2	mg/kg	----	500	**7**	----	----	----	----
Copper	EG005T	5	mg/kg	----	2000	**60**	----	----	----	----
Lead	EG005T	5	mg/kg	----	1200	**49**	----	----	----	----
Nickel	EG005T	2	mg/kg	----	600	**12**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	14000	**79**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	30	<0.1	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	----	----	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	----	----	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	----	----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	----	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	----	----	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	----	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	40	**24.9**	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons										

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time* / Guideline Lower Limit	Guideline Upper Limit	**SB5_0.3-0.4** / 07-Sep-2018 15:00 / **EM1814532-009**	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------
EP075B: Polynuclear Aromatic Hydrocarbons - Continued										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	2	**2.72**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	650	<10	----	----	----	----
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	5000	<50	----	----	----	----
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	5	<0.2	----	----	----	----
Toluene	EP080	0.5	mg/kg	----	100	<0.5	----	----	----	----
Ethylbenzene	EP080	0.5	mg/kg	----	100	<0.5	----	----	----	----
Total Xylenes	EP080	0.5	mg/kg	----	180	<0.5	----	----	----	----

Note: Red shading is applied where the result is equal to or greater than the guideline upper limit and/or equal to or lower than the guideline lower limit.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1814532**	Page	: 1 of 19
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Contact	: Customer Services EM
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Project	: EMC1866	Date Samples Received	: 11-Sep-2018
Order number	:	Date Analysis Commenced	: 11-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 14		
No. of samples analysed	: 14		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

Page	: 2 of 19
Work Order	: EM1814532
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 1926985)									
EM1814408-005	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.7	6.7	0.00	0% - 20%
EM1814468-002	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.0	6.1	1.65	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1925357)									
EM1814524-006	Anonymous	EA055: Moisture Content	----	0.1	%	37.7	38.2	1.15	0% - 20%
EM1814532-010	SB1_1.0-1.1	EA055: Moisture Content	----	0.1	%	13.8	14.3	3.80	0% - 50%
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1925829)									
EM1814532-010	SB1_1.0-1.1	ED006: Calcium/Magnesium Ratio	----	0.1	-	2.8	2.9	0.00	0% - 50%
		ED006: Magnesium/Potassium Ratio	----	0.1	-	5.2	5.2	0.00	0% - 20%
		ED006: Exchangeable Calcium Percent	----	0.2	%	68.9	69.5	0.887	0% - 20%
		ED006: Exchangeable Magnesium Percent	----	0.2	%	24.6	24.2	1.51	0% - 20%
		ED006: Exchangeable Potassium Percent	----	0.2	%	4.7	4.6	2.21	0% - 20%
		ED006: Exchangeable Sodium Percent	----	0.2	%	1.7	1.6	8.50	No Limit
		ED006: Exchangeable Calcium	----	0.2	meq/100g	11.5	12.3	6.46	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	4.1	4.3	4.07	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	0.8	0.8	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	0.3	0.3	0.00	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	16.7	17.7	5.57	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1926466)									
EM1814513-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	140	150	8.94	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	221	252	13.0	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	16	15	0.00	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1926466) - continued									
EM1814513-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	48	47	2.45	0% - 20%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	10	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	52	48	6.67	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	145	144	0.00	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	454	430	5.45	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	523	539	3.05	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	440	381	14.4	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	65700	64800	1.36	0% - 20%
EM1814520-018	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	80	80	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	16	22.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	5	5	0.00	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	9	25.2	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	16	14.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	20	5.32	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	168	179	6.42	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	49	49	0.00	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	13500	14700	8.44	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1926468)									
EM1814532-009	SB5_0.3-0.4	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	60	60	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	10	12	13.7	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	11	0.00	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	60	66	9.37	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	49	63	26.2	0% - 50%
		EG005T: Manganese	7439-96-5	5	mg/kg	285	294	3.19	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1926468) - continued									
EM1814532-009	SB5_0.3-0.4	EG005T: Tin	7440-31-5	5	mg/kg	14	11	30.3	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	79	66	18.3	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	25300	26900	6.24	0% - 20%
EM1814545-002	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	120	150	26.4	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	69	60	15.1	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	8	7	19.4	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	27	17	43.9	0% - 50%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	105	94	11.5	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	15	12	18.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	52	45	14.2	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	29	17.8	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	46800	43300	7.59	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1926467)									
EM1814513-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.5	0.6	0.00	No Limit
EM1814520-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1926469)									
EM1814532-009	SB5_0.3-0.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1814545-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 1926683)									
EM1814452-012	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1814520-007	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 1927459)									
EM1814452-015	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.00	No Limit
EM1814454-004	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.00	No Limit
EK040T: Fluoride Total (QC Lot: 1926668)									
EM1814532-004	SB1_0.2-0.3	EK040T: Fluoride	16984-48-8	40	mg/kg	120	140	14.8	No Limit
EM1814565-006	Anonymous	EK040T: Fluoride	16984-48-8	40	mg/kg	220	180	19.6	No Limit
EP004: Organic Matter (QC Lot: 1927539)									
EM1814411-039	Anonymous	EP004: Organic Matter	----	0.5	%	<0.5	<0.5	0.00	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1926516)									
EM1814401-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit

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Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1926518)									
EM1814401-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1926503)									
EM1814532-005	SB1_0.5-0.6	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1926515)									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)A: Phenolic Compounds (QC Lot: 1926515) - continued									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EM1814401-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1926503)									
EM1814532-005	SB1_0.5-0.6	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1926515)									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.6	23.9	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1926515) - continued									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.5	2.0	23.1	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	<0.5	28.4	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	4.9	4.4	9.41	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	4.9	4.5	7.91	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	2.3	2.4	5.97	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	2.3	2.2	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.8	3.1	9.83	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.1	1.1	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.7	2.8	5.60	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.7	1.8	7.43	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.0	2.2	6.09	No Limit
EM1814401-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1928641)									
EM1814532-004	SB1_0.2-0.3	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	2.97	# 2.23	28.3	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1925188)									
EM1814532-003	QCP_7/9/18	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1814532-013	SB4_1.3-1.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926502)									
EM1814532-014	SB5_0.5-0.6	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926502) - continued									
EM1814532-014	SB5_0.5-0.6	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1814532-005	SB1_0.5-0.6	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926517)									
EM1814532-004	SB1_0.2-0.3	EP071: C15 - C28 Fraction	----	100	mg/kg	210	150	31.1	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	210	150	33.3	No Limit
EM1814401-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1925188)									
EM1814532-003	QCP_7/9/18	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1814532-013	SB4_1.3-1.4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1926502)									
EM1814532-014	SB5_0.5-0.6	EP071: >C16 - C34 Fraction	----	100	mg/kg	100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	100	<50	66.7	No Limit
EM1814532-005	SB1_0.5-0.6	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1926517)									
EM1814532-004	SB1_0.2-0.3	EP071: >C16 - C34 Fraction	----	100	mg/kg	280	220	21.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	280	220	24.0	No Limit
EM1814401-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1925188)									
EM1814532-003	QCP_7/9/18	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1925188) - continued									
EM1814532-003	QCP_7/9/18	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1814532-013	SB4_1.3-1.4	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1925179)									
EM1814515-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	960	580	50.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	250	80	98.6	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	600	# 210	95.4	0% - 50%
EM1814518-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926039)									
EM1814473-041	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1814473-044	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1925179)									
EM1814515-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	300	100	95.2	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	1390	# 740	61.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	µg/L	360	100	113	No Limit
EM1814518-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1926039)									
EM1814473-041	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1814473-044	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1926039)									
EM1814473-041	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	16	14	16.7	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 1926039) - continued									
EM1814473-041	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1814473-044	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 1925829)								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	33 meq/100g	91.1	75	120
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	32 meq/100g	82.3	75	120
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	2.2 meq/100g	98.6	75	120
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	5.6 meq/100g	91.7	75	120
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Calcium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Magnesium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Potassium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Calcium/Magnesium Ratio	----	0.1	-	<0.1	----	----	----	----
ED006: Magnesium/Potassium Ratio	----	0.1	-	<0.1	----	----	----	----
EG005T: Total Metals by ICP-AES (QCLot: 1926466)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	94.2	78	107
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	104	76	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	101	84	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.7	76	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	96.5	78	110
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	96.8	78	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.7	78	108
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	90.2	84	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	91.3	78	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	98.8	81	110
EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	7.9 mg/kg	92.0	78	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	80	109
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	92	110
EG005T: Silver	7440-22-4	2	mg/kg	<2	2.1 mg/kg	85.1	80	108
EG005T: Tin	7440-31-5	5	mg/kg	<5	5.2 mg/kg	99.8	78	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.1	79	110
EG005T: Total Metals by ICP-AES (QCLot: 1926468)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	93.4	78	107
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	106	76	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	102	84	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.3	76	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	97.5	78	110

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1926468) - continued								
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	97.2	78	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.2	78	108
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	92.0	84	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	92.1	78	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	99.9	81	110
EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	7.9 mg/kg	87.6	78	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	80	109
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	92	110
EG005T: Silver	7440-22-4	2	mg/kg	<2	2.1 mg/kg	85.7	80	108
EG005T: Tin	7440-31-5	5	mg/kg	<5	5.2 mg/kg	90.0	78	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.9	79	110
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926467)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	78.2	77	104
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926469)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	78.6	77	104
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 1926683)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	40 mg/kg	79.0	75	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 1927459)								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	92.4	80	107
EK040T: Fluoride Total (QCLot: 1926668)								
EK040T: Fluoride	16984-48-8	40	mg/kg	<40	400 mg/kg	88.2	75	110
EP004: Organic Matter (QCLot: 1927539)								
EP004: Organic Matter	----	0.5	%	<0.5	77 %	98.0	71	109
EP004: Total Organic Carbon	----	0.5	%	<0.5	43.5 %	101	73	111
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1926516)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	89.3	63	115
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	65	120
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.8	68	121
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	70	121
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	64	119
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	56	121
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	63	114
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	64	121
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	68	120
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	72	124
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	69	125

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518) - continued								
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	71	123
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	59	123
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	70	123
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.1	64	119
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	69	124
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	66	128
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	102	62	121
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	57	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.4	60	124
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	73	120
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	91.5	61	121
EP075(SIM)A: Phenolic Compounds (QCLot: 1926503)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	93.4	70	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	93.3	74	128
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	91.8	76	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	90.4	70	128
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	72.3	56	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	89.6	70	122
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	88.4	70	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	92.6	70	126
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	86.3	67	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	81.4	63	121
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	82.6	71	133
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	33.9	20	110
EP075(SIM)A: Phenolic Compounds (QCLot: 1926515)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	98.8	70	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	101	74	128
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	100	76	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	105	70	128
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	83.6	56	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	103	70	122
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	99.1	70	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	96.7	70	126
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	93.7	67	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	93.5	63	121
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	93.5	71	133
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	73.1	20	110
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926503)								

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926503) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	98.3	75	131
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	85.9	70	132
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	93.2	80	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	90.6	70	128
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	95.6	80	128
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	96.7	72	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	93.8	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	96.9	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	90.9	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	98.4	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	87.5	71	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	98.2	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	87.4	70	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	76.2	71	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	75.6	72	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	76.3	68	127
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926515)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	101	75	131
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	93.9	70	132
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	100	80	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	97.7	70	128
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	104	80	128
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	107	72	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	104	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	105	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	104	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	111	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	90.4	71	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	102	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	85.2	70	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	95.3	71	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	98.8	72	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	95.1	68	127
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 1928641)								
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925188)								

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925188) - continued								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	80.4	70	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926502)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	106	80	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	113	84	115
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	104	80	112
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926517)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	96.4	80	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	99.2	84	115
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	91.0	80	112
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925188)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	77.0	68	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926502)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	109	83	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	111	82	114
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	106	73	115
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926517)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	99.3	83	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	95.7	82	114
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	85.0	73	115
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN (QCLot: 1925188)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	82.8	74	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	85.6	77	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	85.7	73	125
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	88.0	77	128
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	94.5	81	128
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	87.2	66	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925179)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4331 µg/L	95.1	58	134
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16952 µg/L	93.4	60	133

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925179) - continued								
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8695 µg/L	94.2	54	137
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926039)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	93.1	68	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925179)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6292 µg/L	94.3	58	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22143 µg/L	96.1	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1677 µg/L	94.5	58	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926039)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	93.1	66	123
EP080: BTEXN (QCLot: 1926039)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	99.2	74	123
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	96.8	77	128
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	101	73	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	100	72	131
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	74	131
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.6	74	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 1926466)							
EM1814520-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	96.0	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	110	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	95.4	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.0	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	93.3	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	101	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	92.1	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	68	136
		EG005T: Molybdenum	7439-98-7	50 mg/kg	90.9	79	117
		EG005T: Nickel	7440-02-0	50 mg/kg	89.6	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	90.0	71	125

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1926466) - continued							
EM1814520-001	Anonymous	EG005T: Zinc	7440-66-6	50 mg/kg	90.2	74	128
EG005T: Total Metals by ICP-AES (QCLot: 1926468)							
EM1814532-011	SB2_0.5-0.6	EG005T: Lead	7439-92-1	50 mg/kg	94.3	76	124
EM1814532-011	SB2_0.5-0.6	EG005T: Arsenic	7440-38-2	50 mg/kg	94.5	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	107	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	98.5	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.5	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	79.9	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	101	82	124
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	68	136
		EG005T: Molybdenum	7439-98-7	50 mg/kg	87.4	79	117
		EG005T: Nickel	7440-02-0	50 mg/kg	86.9	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	91.3	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	91.6	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926467)							
EM1814520-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	79.6	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926469)							
EM1814532-011	SB2_0.5-0.6	EG035T: Mercury	7439-97-6	5 mg/kg	86.3	76	116
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 1926683)							
EM1814452-013	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	40 mg/kg	75.8	58	114
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 1927459)							
EM1814452-016	Anonymous	EK026SF: Total Cyanide	57-12-5	20 mg/kg	93.1	77	113
EK040T: Fluoride Total (QCLot: 1926668)							
EM1814562-001	Anonymous	EK040T: Fluoride	16984-48-8	400 mg/kg	103	70	130
EP004: Organic Matter (QCLot: 1927539)							
EM1814424-004	Anonymous	EP004: Organic Matter	----	1.03 %	84.2	70	120
		EP004: Total Organic Carbon	----	0.6 %	83.7	70	120
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1926516)							
EM1814401-004	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	89.0	44	144
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518)							
EM1814401-004	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	91.5	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	92.1	18	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	100	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	96.3	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	85.0	23	146

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518) - continued							
EM1814401-004	Anonymous	EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	70.2	20	133
EP075(SIM)A: Phenolic Compounds (QCLot: 1926503)							
EM1814532-006	SB2_0.2-0.3	EP075(SIM): Phenol	108-95-2	3 mg/kg	82.9	63	117
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	84.0	65	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	74.3	40	134
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	75.3	56	122
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	44.6	15	139
EP075(SIM)A: Phenolic Compounds (QCLot: 1926515)							
EM1814225-009	Anonymous	EP075(SIM): Phenol	108-95-2	3 mg/kg	98.1	63	117
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	97.8	65	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	82.3	40	134
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	93.4	56	122
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	64.8	15	139
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926503)							
EM1814532-006	SB2_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	91.5	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	118	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926515)							
EM1814225-009	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	98.6	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	104	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925188)							
EM1814532-003	QCP_7/9/18	EP080: C6 - C9 Fraction	----	28 mg/kg	92.5	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926502)							
EM1814532-003	QCP_7/9/18	EP071: C10 - C14 Fraction	----	806 mg/kg	91.9	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	96.2	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	86.0	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926517)							
EM1814401-003	Anonymous	EP071: C10 - C14 Fraction	----	806 mg/kg	96.4	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	98.5	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	90.3	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925188)							
EM1814532-003	QCP_7/9/18	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	89.4	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926502)							
EM1814532-003	QCP_7/9/18	EP071: >C10 - C16 Fraction	----	1160 mg/kg	93.6	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	92.7	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	89.6	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926517)							

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Work Order	: EM1814532
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926517) - continued							
EM1814401-003	Anonymous	EP071: >C10 - C16 Fraction	----	1160 mg/kg	98.9	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	94.9	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	86.5	44	126
EP080: BTEXN (QCLot: 1925188)							
EM1814532-003	QCP_7/9/18	EP080: Benzene	71-43-2	2 mg/kg	115	50	136
		EP080: Toluene	108-88-3	2 mg/kg	115	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925179)							
EM1814532-001	RB_7/9/18	EP071: C10 - C14 Fraction	----	4331 µg/L	86.1	50	130
		EP071: C15 - C28 Fraction	----	16952 µg/L	84.4	54	136
		EP071: C29 - C36 Fraction	----	8695 µg/L	85.2	50	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926039)							
EM1814473-042	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	66.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925179)							
EM1814532-001	RB_7/9/18	EP071: >C10 - C16 Fraction	----	6292 µg/L	85.0	50	128
		EP071: >C16 - C34 Fraction	----	22143 µg/L	86.8	50	150
		EP071: >C34 - C40 Fraction	----	1677 µg/L	89.4	51	159
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926039)							
EM1814473-042	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	65.0	44	122
EP080: BTEXN (QCLot: 1926039)							
EM1814473-042	Anonymous	EP080: Benzene	71-43-2	20 µg/L	85.7	68	130
		EP080: Toluene	108-88-3	20 µg/L	82.4	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1814532**	Page	: 1 of 10
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Telephone	: +61-3-8549 9600
Project	: EMC1866	Date Samples Received	: 11-Sep-2018
Site	: North Hobart Oval	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND	No. of samples received	: 14
Order number	:	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075B: Polynuclear Aromatic Hydrocarbons	EM1814532--004	SB1_0.2-0.3	**Benzo(a)pyrene**	50-32-8	28.3 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1814520--001	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG005T: Total Metals by ICP-AES	EM1814532--011	SB2_0.5-0.6	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM1814515--004	Anonymous	**C29 - C36 Fraction**	----	95.4 %	0% - 50%	**RPD exceeds LOR based limits**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1814515--004	Anonymous	**>C16 - C34 Fraction**	----	61.0 %	0% - 50%	**RPD exceeds LOR based limits**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001)								
SB1_1.0-1.1		**07-Sep-2018**	**13-Sep-2018**	14-Sep-2018	✓	**13-Sep-2018**	13-Sep-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
TB_7/9/18,	QCP_7/9/18,	**07-Sep-2018**	----	----	----	**11-Sep-2018**	21-Sep-2018	✓
SB1_0.2-0.3,	SB1_0.5-0.6,							
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB1_1.0-1.1,							
SB2_0.5-0.6,	SB4_1.3-1.4,							
SB5_0.5-0.6								
Soil Glass Jar - Unpreserved (EA055)								
SB3_0.4-0.5,	SB3_0.9-1.0	**10-Sep-2018**	----	----	----	**11-Sep-2018**	24-Sep-2018	✓

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006)							
SB1_1.0-1.1	07-Sep-2018	11-Sep-2018	05-Oct-2018	✓	14-Sep-2018	05-Oct-2018	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007)							
SB1_1.0-1.1	07-Sep-2018	11-Sep-2018	05-Oct-2018	✓	14-Sep-2018	05-Oct-2018	✓
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008)							
SB1_1.0-1.1	07-Sep-2018	11-Sep-2018	05-Oct-2018	✓	14-Sep-2018	05-Oct-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB1_1.0-1.1, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	12-Sep-2018	06-Mar-2019	✓	12-Sep-2018	06-Mar-2019	✓
Soil Glass Jar - Unpreserved (EG005T)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	09-Mar-2019	✓	12-Sep-2018	09-Mar-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	12-Sep-2018	05-Oct-2018	✓	13-Sep-2018	05-Oct-2018	✓
Soil Glass Jar - Unpreserved (EG035T)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	08-Oct-2018	✓	13-Sep-2018	08-Oct-2018	✓
EG048: Hexavalent Chromium (Alkaline Digest)							
Soil Glass Jar - Unpreserved (EG048G)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	05-Oct-2018	✓	12-Sep-2018	19-Sep-2018	✓
EK026SF: Total CN by Segmented Flow Analyser							
Soil Glass Jar - Unpreserved (EK026SF)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	26-Sep-2018	✓
EK040T: Fluoride Total							
Soil Glass Jar - Unpreserved (EK040T)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	05-Oct-2018	✓	13-Sep-2018	05-Oct-2018	✓
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004)							
SB1_1.0-1.1	07-Sep-2018	13-Sep-2018	05-Oct-2018	✓	13-Sep-2018	05-Oct-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
SB1_0.2-0.3		07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved (EP075(SIM))								
SB1_0.2-0.3		07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
SB1_0.2-0.3,	SB1_0.5-0.6,	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB2_0.5-0.6,							
SB4_1.3-1.4,	SB5_0.5-0.6							
Soil Glass Jar - Unpreserved (EP075(SIM))								
SB3_0.4-0.5,	SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	24-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP075B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075-TAS)								
SB1_0.2-0.3,	SB1_0.5-0.6,	07-Sep-2018	13-Sep-2018	21-Sep-2018	✓	13-Sep-2018	23-Oct-2018	✓
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4								
Soil Glass Jar - Unpreserved (EP075-TAS)								
SB3_0.4-0.5		10-Sep-2018	13-Sep-2018	24-Sep-2018	✓	13-Sep-2018	23-Oct-2018	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
TB_7/9/18,	QCP_7/9/18,	07-Sep-2018	11-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
SB1_0.2-0.3,	SB1_0.5-0.6,							
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB2_0.5-0.6,							
SB4_1.3-1.4,	SB5_0.5-0.6							
Soil Glass Jar - Unpreserved (EP071)								
TB_7/9/18,	QCP_7/9/18,	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
SB1_0.2-0.3,	SB1_0.5-0.6,							
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB2_0.5-0.6,							
SB4_1.3-1.4,	SB5_0.5-0.6							
Soil Glass Jar - Unpreserved (EP080)								
SB3_0.4-0.5,	SB3_0.9-1.0	10-Sep-2018	11-Sep-2018	24-Sep-2018	✓	13-Sep-2018	24-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)								
SB3_0.4-0.5,	SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	24-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
TB_7/9/18, QCP_7/9/18, SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	11-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)							
TB_7/9/18, QCP_7/9/18, SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	11-Sep-2018	24-Sep-2018	✓	13-Sep-2018	24-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	24-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TB_7/9/18, QCP_7/9/18, SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	11-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	11-Sep-2018	24-Sep-2018	✓	13-Sep-2018	24-Sep-2018	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	14-Sep-2018	✓	13-Sep-2018	22-Oct-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	14-Sep-2018	✓	13-Sep-2018	22-Oct-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓

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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	35	11.43	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	38	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Organic Matter	EP004	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	38	7.89	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
TRH - Semivolatile Fraction	EP071	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Lyons (2011) 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060A. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Total Fluoride	EK040T	SOIL	(In-house) Total fluoride is determined by ion specific electrode (ISE) in a solution obtained after a Sodium Carbonate / Potassium Carbonate fusion dissolution.
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3).
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 502)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Higginson 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons 2011 method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Alkaline digestion for Hexavalent Chromium	EG048PR	SOIL	In house: Referenced to USEPA SW846, Method 3060A.
Total Fluoride	EK040T-PR	SOIL	In house: Samples are fused with Sodium Carbonate / Potassium Carbonate flux.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach following drying at 40°C	EN34-AD	SOIL	10 g of 40°C dried soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

TNT 9820 0322 7963

2018 EMAC Air Canister Chain Of Custody V1

Chain of Custody and Analysis Request

Page : 1 of 1

Site Name:	North Hobart Oval	**Client :**	**Environmental Management and Consulting Pty Ltd**	**Primary Laboratory**	**Secondary Laboratory**
Project No.:	EMC1866	**Quote Number:**	**MEBQ/117/16**	*ALS Laboratory Group*	**Eurofins MGT**
Sampled By:	**Alex Lovibond**	**Project Manager :**	**Simon Chilsett**	*5/585 Maitland Rd*	2-5 Kingston Town Close
Phone :	**0439 306 677**	**Phone :**	**0428 288 258**	*Mayfield West, NSW 2304*	Oakleigh, VIC, 3168
Canister Req. No.:	-	**INVOICES TO:**	admin@enviromac.com.au	Phone : *02 4014 2500*	Phone : 03) 9564 7055
EDD Format (or Default):	Default			Samples.newcastle@alsglobal.com	

RESULTS : Results Required By: 24hrs 48hrs 3 days 5 days other: _____
Additional fee +40% +20% +10%

Send Results & Copy of COC to:

Simon Chilsett	**Alex Lovibond**	**Tom Latham**
Email: simon@enviromac.com.au	***Email:*** alex@enviromac.com.a	***Email:*** Tom@enviromac.com.au
Phone: 0428 288 258	***Phone:*** 0439 306 677	***Phone:*** 0488 515 991

GAS SAMPLE INFORMATION							Analysis Requested					Additional Information
ALS Use Only	Sample Details						Suite Codes must be listed to attract suite price					
						Reporting Requirements						
						LORs			Units			
Lab ID	Tedlar Bag ID	Estimated Sample Volume (L)		Date (Time Sampled)	Matrix (eg Air, Soil Gas)	Ambient Air	Soil Gas (NEPM)	Other / Indoor	ppbv, µg/m3	ppmv, mg/m3	EP101-NSG - NEPM Suite. BTEXN + Vinyl Chloride, PCE, TCE, TCA, cis-1,2-Dichloroethene (12 Analytes, 6 Fractions incl' calculated F1,F2)	EP104-PVI – CRCCARE PVI Guidance Key Indicator Gases (4 analytes: He, O2, CO2 + CH4)	EP103-PHSG – Total Petroleum Hydrocarbons and NEPM TRH to C16 (13 Analytes and 6 Fractions incl' calculated F1, F2)			Comments on LORs required, potential hazards, likely contaminant levels, or samples requring specific QC analysis etc
1	SV1_0.8-1.0	2		11/09/2018 (3:00 PM)	Soil Gas	-	x	-	x	-	x	x				
	QCP_11/09/18	2		11/09/2018 (3:00 PM)	Soil Gas	-	x	-	x	-			x			

Environmental Division
Newcastle
Work Order Reference
EN1805943

Telephone : - 61 2 4014 2500

Relinq. By:	Date:	Couriered By:	Date:	Received By:	Date:
Alex Lovibond	11/09/18				12/9/18
Signature:	Time: 2:00PM	Signature:	Time	Signature:	Time: 9am

Lab Use Only			
Custody Seal Intact?	Rec. Lab Y / N	NEY / N	N / A
Valves closed on Rec.?	Rec. Lab Y / N	NEY / N	N / A
Canister/Sampler Complete and Not damaged?			Y / N
Other Comments?		Temp Rec:	

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EN1805943**		
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Contact	:
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
E-mail	: simon@enviromac.com.au	E-mail	:
Telephone	: +61 0408 391 738	Telephone	: +61 2 4014 2500
Facsimile	: +61 03 6231 5979	Facsimile	: +61 2 4967 7382
Project	: EMC1866	Page	: 1 of 3
Order number	:	Quote number	: EB2017ENVMANCON0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: North Hobart Oval		
Sampler	: ALEX LOVIBOND		

Dates

Date Samples Received	: 12-Sep-2018 09:00	Issue Date	: 12-Sep-2018
Client Requested Due Date	: 19-Sep-2018	Scheduled Reporting Date	: **19-Sep-2018**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	: Tedlar bag for sample "QCP_11/09/18" received deflated with insufficient volume to analyse.	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables

Issue Date	: 12-Sep-2018
Page	: 2 of 3
Work Order	: EN1805943 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method *Client sample ID*	Sample Container Received	Preferred Sample Container for Analysis
VOCs in Air by USEPA TO15r - Extended Suite : EP101-15X		
SV1_0.8-1.0	- Tedlar bag	- Gas Canister - ALS Stainless Steel Silonite
Volatile TPH/TRH in Gaseous Samples : EP103-PC		
SV1_0.8-1.0	- Tedlar bag	- Gas Canister - ALS Stainless Steel Silonite

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **AIR**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	AIR - EP104-PVI CRCCare PVI - Key Indicators - Gases	AIR - SG-V2-PH Soil Gas - BTEXN + NEPM TPH + Chlorinated
EN1805943-001	11-Sep-2018 15:00	SV1_0.8-1.0	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Issue Date	: 12-Sep-2018
Page	: 3 of 3
Work Order	: EN1805943 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Requested Deliverables

ALEX LOVIBOND		
- *AU Certificate of Analysis - NATA (COA)	Email	alex@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - USEPA (QC-USEPA)	Email	alex@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	alex@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	alex@enviromac.com.au
- EDI Format - ESDAT (ESDAT)	Email	alex@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	alex@enviromac.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	admin@enviromac.com.au
SIMON CHISLETT		
- *AU Certificate of Analysis - NATA (COA)	Email	simon@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	simon@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - USEPA (QC-USEPA)	Email	simon@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	simon@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	simon@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	simon@enviromac.com.au
- EDI Format - ESDAT (ESDAT)	Email	simon@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	simon@enviromac.com.au
TOM LATHAM		
- *AU Certificate of Analysis - NATA (COA)	Email	tom@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - USEPA (QC-USEPA)	Email	tom@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	tom@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	tom@enviromac.com.au
- EDI Format - ESDAT (ESDAT)	Email	tom@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	tom@enviromac.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EN1805943**	Page	: 1 of 6
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Contact	:
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 0408 391 738	Telephone	: +61 2 4014 2500
Project	: EMC1866	Date Samples Received	: 12-Sep-2018 09:00
Order number	:	Date Analysis Commenced	: 12-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018 16:46
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP101: ALS quality procedures (QWI-EN/38) permit, for organic trace analysis, that the recoveries of 20% of target compounds may lie outside of established control limits as long as these remain within acceptable ranges defined within referenced USEPA methods.
- EP101, EP103: Results reported in µg/m³ are calculated from PPBV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure
- EP104: Results reported in mg/m³ are calculated from Mol% results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa
- EP104: Sample canisters were received at sub-ambient pressures and required dilution in the laboratory prior to analysis. LOR values have been adjusted accordingly

Analytical Results

Sub-Matrix: AIR (Matrix: AIR)			Client sample ID	SV1_0.8-1.0	----	----	----	----
			Client sampling date / time	11-Sep-2018 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EN1805943-001	--------	--------	--------	--------
				Result	----	----	----	----
EP104: Light Hydrocarbons								
Methane	74-82-8	0.050	Mol %	<0.100	----	----	----	----
EP104: Light Hydrocarbons (Calc Conc)								
Methane	74-82-8	330000	µg/m³	<660000	----	----	----	----
EP104: Permanent Gases								
Carbon Dioxide	124-38-9	0.050	Mol %	**2.81**	----	----	----	----
Oxygen	7782-44-7	0.10	Mol %	**17.7**	----	----	----	----
Helium	7440-59-7	0.005	Mol %	<0.010	----	----	----	----
EP104: Permanent Gases (Calc Conc)								
Carbon Dioxide	124-38-9	900000	µg/m³	**50500000**	----	----	----	----
Oxygen	7782-44-7	1310000	µg/m³	**231000000**	----	----	----	----
Helium	7440-59-7	8000	µg/m³	<16000	----	----	----	----

Page : 4 of 6
Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	SV1_0.8-1.0	----	----	----	----
				Client sampling date / time	11-Sep-2018 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EN1805943-001	--------	--------	--------	--------	--------
				Result	----	----	----	----	----
EP101: VOCs by USEPA Method TO15 (Calculated Concentration)									
Vinyl chloride	75-01-4	5.1	µg/m³	<5.1	----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	20.0	µg/m³	<20.0	----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	270	µg/m³	<270	----	----	----	----	----
Benzene	71-43-2	100	µg/m³	<100	----	----	----	----	----
Trichloroethene	79-01-6	5.4	µg/m³	<5.4	----	----	----	----	----
Toluene	108-88-3	190	µg/m³	<190	----	----	----	----	----
Tetrachloroethene	127-18-4	340	µg/m³	<340	----	----	----	----	----
Ethylbenzene	100-41-4	220	µg/m³	<220	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	430	µg/m³	<430	----	----	----	----	----
ortho-Xylene	95-47-6	220	µg/m³	<220	----	----	----	----	----
Naphthalene	91-20-3	100	µg/m³	<100	----	----	----	----	----
EP101: VOCs by USEPA Method TO15r									
Vinyl chloride	75-01-4	2.0	ppbv	<2.0	----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5.0	ppbv	<5.0	----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	50.0	ppbv	<50.0	----	----	----	----	----
Benzene	71-43-2	30.0	ppbv	<30.0	----	----	----	----	----
Trichloroethene	79-01-6	1.0	ppbv	<1.0	----	----	----	----	----
Toluene	108-88-3	50.0	ppbv	<50.0	----	----	----	----	----
Tetrachloroethene	127-18-4	50.0	ppbv	<50.0	----	----	----	----	----
Ethylbenzene	100-41-4	50.0	ppbv	<50.0	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	100	ppbv	<100	----	----	----	----	----
ortho-Xylene	95-47-6	50.0	ppbv	<50.0	----	----	----	----	----
Naphthalene	91-20-3	19.0	ppbv	<19.0	----	----	----	----	----
EP103: Petroleum Hydrocarbons in Gaseous Samples									
C6 - C9 Fraction	----	5000	ppbv	<5000	----	----	----	----	----
C10 - C14 Fraction	----	5000	ppbv	<5000	----	----	----	----	----
EP103: Petroleum Hydrocarbons in Gaseous Samples (Calc Conc)									
C6 - C9 Fraction	----	20000	µg/m³	<20000	----	----	----	----	----
C10 - C14 Fraction	----	35000	µg/m³	<35000	----	----	----	----	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013									
C6 - C10 Fraction	C6_C10	5000	ppbv	<5000	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	5000	ppbv	<5000	----	----	----	----	----
>C10 - C16 Fraction	----	5000	ppbv	<5000	----	----	----	----	----

Page : 5 of 6
Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	SV1_0.8-1.0	----	----	----	----
				Client sampling date / time	11-Sep-2018 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EN1805943-001	--------	--------	--------	--------
					Result	---	----	----	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013 - Continued									
>C10 - C16 Fraction minus Naphthalene (F2)	----	5000	ppbv		<5000	----	----	----	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (Calc Conc)									
C6 - C10 Fraction	C6_C10	20000	µg/m³		<20000	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20000	µg/m³		<20000	----	----	----	----
>C10 - C16 Fraction	----	40000	µg/m³		<40000	----	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	40000	µg/m³		<40000	----	----	----	----
USEPA Air Toxics Method TO15r Surrogates									
4-Bromofluorobenzene	460-00-4	0.5	%		87.6	----	----	----	----

Page	:	6 of 6
Work Order	:	EN1805943
Client	:	ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	:	EMC1866

Surrogate Control Limits

Sub-Matrix: SOIL GAS

Compound	CAS Number	Recovery Limits (%) Low	High
USEPA Air Toxics Method TO15r Surrogates			
4-Bromofluorobenzene	460-00-4	60	140

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EN1805943**	Page	: 1 of 4
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Contact	:
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 0408 391 738	Telephone	: +61 2 4014 2500
Project	: EMC1866	Date Samples Received	: 12-Sep-2018
Order number	:	Date Analysis Commenced	: 12-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report ; Recovery and Acceptance Limits
- Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW

Page : 2 of 4
Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **AIR**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP101: VOCs by USEPA Method TO15r (QC Lot: 1927629)									
EN1805774-001	Anonymous	EP101-15X: Vinyl chloride	75-01-4	0.5	ppbv	<2.0	<2.0	0.00	No Limit
		EP101-15X: cis-1.2-Dichloroethene	156-59-2	0.5	ppbv	<5.0	<5.0	0.00	No Limit
		EP101-15X: 1.1.1-Trichloroethane	71-55-6	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Benzene	71-43-2	0.5	ppbv	<30.0	<30.0	0.00	No Limit
		EP101-15X: Trichloroethene	79-01-6	0.5	ppbv	<1.0	<1.0	0.00	No Limit
		EP101-15X: Toluene	108-88-3	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Tetrachloroethene	127-18-4	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Ethylbenzene	100-41-4	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: ortho-Xylene	95-47-6	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Naphthalene	91-20-3	0.5	ppbv	<19.0	<19.0	0.00	No Limit
		EP101-15X: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	<100	<100	0.00	No Limit
EP103: Petroleum Hydrocarbons in Gaseous Samples (QC Lot: 1927630)									
EN1805774-001	Anonymous	EP103-PC: C6 - C9 Fraction	----	50	ppbv	<5000	<5000	0.00	No Limit
		EP103-PC: C10 - C14 Fraction	----	50	ppbv	<5000	<5000	0.00	No Limit
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 1927630)									
EN1805774-001	Anonymous	EP103-PC: C6 - C10 Fraction	C6_C10	50	ppbv	<5000	<5000	0.00	No Limit
		EP103-PC: >C10 - C16 Fraction	----	50	ppbv	<5000	<5000	0.00	No Limit
EP104: Light Hydrocarbons (QC Lot: 1932086)									
EN1805919-001	Anonymous	EP104: Methane	74-82-8	0.05	Mol %	<0.125	<0.125	0.00	0% - 20%
EN1805943-001	SV1_0.8-1.0	EP104: Methane	74-82-8	0.05	Mol %	<0.100	<0.100	0.00	0% - 20%
EP104: Permanent Gases (QC Lot: 1932086)									
EN1805919-001	Anonymous	EP104: Carbon Dioxide	124-38-9	0.005	Mol %	0.043	0.041	4.95	0% - 20%
		EP104: Helium	7440-59-7	0.005	Mol %	<0.012	<0.012	0.00	0% - 20%

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Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **AIR**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP104: Permanent Gases (QC Lot: 1932086) - continued									
EN1805919-001	Anonymous	EP104: Oxygen	7782-44-7	0.1	Mol %	20.4	20.5	0.683	0% - 20%
EN1805943-001	SV1_0.8-1.0	EP104: Carbon Dioxide	124-38-9	0.005	Mol %	2.81	2.79	0.540	0% - 20%
		EP104: Helium	7440-59-7	0.005	Mol %	<0.010	<0.010	0.00	0% - 20%
		EP104: Oxygen	7782-44-7	0.1	Mol %	17.7	18.0	1.85	0% - 20%

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Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control terms Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (DCS) refers to certified reference materials, or known interference free matrices spiked with target analytes. The purpose of these QC parameters are to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS and DCS.

Sub-Matrix: **AIR**

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP101: VOCs by USEPA Method TO15r (QCLot: 1927629)											
EP101-15X: Vinyl chloride	75-01-4	0.5	ppbv	<0.5	10 ppbv	106	106	76	130	25	25
EP101-15X: cis-1.2-Dichloroethene	156-59-2	0.5	ppbv	<0.5	10 ppbv	104	103	80	114	25	25
EP101-15X: 1.1.1-Trichloroethane	71-55-6	0.5	ppbv	<0.5	10 ppbv	104	101	84	117	25	25
EP101-15X: Benzene	71-43-2	0.5	ppbv	<0.5	10 ppbv	106	105	81	113	25	25
EP101-15X: Trichloroethene	79-01-6	0.5	ppbv	<0.5	10 ppbv	105	104	84	116	25	25
EP101-15X: Toluene	108-88-3	0.5	ppbv	<0.5	10 ppbv	# 122	# 122	79	120	25	25
EP101-15X: Tetrachloroethene	127-18-4	0.5	ppbv	<0.5	10 ppbv	106	105	77	124	25	25
EP101-15X: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	10 ppbv	108	108	81	120	25	25
EP101-15X: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	<1.0	20 ppbv	106	105	80	125	25	25
EP101-15X: ortho-Xylene	95-47-6	0.5	ppbv	<0.5	10 ppbv	109	108	82	122	25	25
EP101-15X: Naphthalene	91-20-3	0.5	ppbv	<0.5	10 ppbv	83.8	84.0	70	130	25	25
EP103: Petroleum Hydrocarbons in Gaseous Samples (QCLot: 1927630)											
EP103-PC: C6 - C9 Fraction	----	50	ppbv	<50	2800 ppbv	100	101	70	130	25	25
EP103-PC: C10 - C14 Fraction	----	50	ppbv	<50	1200 ppbv	96.9	98.4	70	130	25	25
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 1927630)											
EP103-PC: C6 - C10 Fraction	C6_C10	50	ppbv	<50	3000 ppbv	99.1	100	70	130	25	25
EP103-PC: >C10 - C16 Fraction	----	50	ppbv	<50	500 ppbv	98.7	99.9	70	130	25	25
EP104: Light Hydrocarbons (QCLot: 1932086)											
EP104: Methane	74-82-8	0.05	Mol %	<0.050	0.105 Mol %	91.0	91.9	90	110	25	25
EP104: Permanent Gases (QCLot: 1932086)											
EP104: Carbon Dioxide	124-38-9	0.005	Mol %	<0.005	5.276 Mol %	91.7	91.5	90	110	25	25
EP104: Helium	7440-59-7	0.005	Mol %	<0.005	0.105 Mol %	93.6	92.1	90	110	25	25
EP104: Oxygen	7782-44-7	0.1	Mol %	<0.10	9.304 Mol %	98.6	101	90	110	25	25

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EN1805943**	Page	: 1 of 5
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Telephone	: +61 2 4014 2500
Project	: EMC1866	Date Samples Received	: 12-Sep-2018
Site	: North Hobart Oval	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

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Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **AIR**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP101: VOCs by USEPA Method TO15r	QC-1927629-002	----	**Toluene**	108-88-3	122 %	79-120%	**Recovery greater than upper control limit**
Duplicate Control Spike (DCS) Recoveries							
EP101: VOCs by USEPA Method TO15r	QC-1927629-003	----	**Toluene**	108-88-3	122 %	79-120%	**Recovery greater than upper control limit**

Outliers : Frequency of Quality Control Samples

Matrix: **AIR**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Duplicate Control Samples (DCS)					
Permanent Gases and Light Hydrocarbons	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)					
Permanent Gases and Light Hydrocarbons	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **AIR** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP101: VOCs by USEPA Method TO15r							
Tedlar bag (EP101-15X) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**12-Sep-2018**	11-Oct-2018	✓
EP103: Petroleum Hydrocarbons in Gaseous Samples							
Tedlar bag (EP103-PC) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**12-Sep-2018**	11-Oct-2018	✓
EP103: Total Recoverable Hydrocarbons - NEPM 2013							
Tedlar bag (EP103-PC) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**12-Sep-2018**	11-Oct-2018	✓
EP104: Light Hydrocarbons							
Tedlar bag (EP104) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**14-Sep-2018**	14-Sep-2018	✓

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Matrix: **AIR**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP104: Permanent Gases							
Tedlar bag (EP104)							
SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**14-Sep-2018**	14-Sep-2018	✓

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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **AIR**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Duplicate Control Samples (DCS)							
Permanent Gases and Light Hydrocarbons	EP104	1	11	9.09	10.00	×	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Permanent Gases and Light Hydrocarbons	EP104	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Permanent Gases and Light Hydrocarbons	EP104	1	11	9.09	10.00	×	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Permanent Gases and Light Hydrocarbons	EP104	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Work Order	:	EN1805943
Client	:	ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	:	EMC1866

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite
VOCs in Air by USEPA TO15r - Extended Suite (mass/volume)	EP101-15X-MV	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite (Calculated Concentration)
Volatile TPH/TRH in Gaseous Samples	EP103-PC	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013)
Volatile TPH/TRH in Gaseous Samples (Calc Conc)	EP103-PC-MV	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013) Calculated from ppbv results based on given Temperature and Atmospheric Pressure and mid-range molecular weights
Permanent Gases and Light Hydrocarbons	EP104	AIR	Hydrocarbons, Carbon Dioxide and Carbon Monoxide by GC-FID-TCD. Gases by GC-TCD In house: Referenced to ASTM D1945 applied to Gases and Light Hydrocarbons (C1-C4) using capillary GC
Permanent Gases and Light Hydrocarbons (mass/volume)	EP104-MV	AIR	Permanent Gases and Light Hydrocarbons - Calculated as mass/volume concentration from percentage composition and given termperature and pressure.

Appendix D

Assessment Data Quality Indicator (DQI) Checklist

Data Quality Indicatiors Checklis

List the laboratory batch numbers in the reporting period to which this DQI checklist relates				
Report ID	**Report Description**			**Report Issue Date**
EM1814532	Soil assessment			17/09/18
EN1805943	Soil Vapour Assessment			17/09/18
		Yes	**No**	**NA**
Are all laboratory reports included within EM&C report as an appendix?				
Comments: SRN, CoA, QC, QCI and CoC supplied				
Comparability (the confident expressed qualitatively that data may be considered to be equivalent for each sampling and analytical event)				
		Yes	**No**	**NA**
Was the EM&C Standard Operating Procedure for sampling used?				
Comments:				
Were consistent sample types collected according to SAQP?				
Comments:				
Who was conducting the sampling?				
Comments: Soil and soil vapour sampling was conducted by Alex Lovibond.				
Was the same laboratory and laboratory method used?				
Comments:				
Have the same units of measurement been used?				
Comments:				
Were climate conditions recorded? (if relevant)				
Comments:				

Data Quality Indicators Checklis

Precision (a quantitative measure of the variability (or reproducibility) of data)			
	Yes	No	NA
Is the blind duplicate/split ID generic and does it not reveal the reference sample ID?			
Comments:			
Is RPD within 0-50% for samples with concentrations >10*LOR and within 100% for samples with concentration <10*LOR:			
Comments: See Tables 4a and 4b for full RPD analysis			
Has the Primary laboratory QA/QC reported any anomalies?			
Comments: Where outliers exist, comments will be provided below the report ID			

	Intra Lab QCS					Analysis Holding Time	Frequency of Intra Lab QC Samples	
Report ID	Lab Method Blank	Lab Control	Matrix Spike	Lab Duplicate	Surrogate Recovery	Holding Time breach	Frequency Breach	Report Issue Date
EM1814532	No	No	Yes	Yes	No	No	No	17/09/18
Matrix Spike: EP075B: Polynuclear Aromatic Hydrocarbons - RPD exceeds LOR based limits. Calculated RPD limits: 0%-20%. Actual result 28.3%. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Lab Duplicate: EP080/071: Total Petroleum Hydrocarbons - RPD exceeds LOR based limits. Calculated RPD limits: 0%-50%. Actual result 95.4%. This intra lab QAQC result was taken from a sample not part of this assessments samples, but from an external sample analysed as part of the laboratory batch. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Lab Duplicate: Total Recoverable Hydrocarbons - NEPM 2013 fractions - RPD exceeds LOR based limits. Calculated RPD limits: 0%-50%. Actual result 61.0%. This intra lab QAQC result was taken from a sample not part of this assessments samples, but from an external sample analysed as part of the laboratory batch. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Lab Duplicate: EG005T: Total Metals by ICP-AES - MS recovery not determined, background level greater than or equal to 4x spike level. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
EP071 and EP071/-SV: Intra Lab Quality Control Sample Frequency Outliers exist. Not enough duplicate sample bottles provided for intra lab duplicate and/or QC matix spike testing. This result may be due to standard laboratory practice of running samples through in grouped project 'analytical lots'. This practise may involve splitting EM&Cs submitted samples over multiple analytical lots. EM&C have no control over the number of intra lab duplicates in which their samples are analysed, other than providing additional sample bottles at the specified frequency (a practise that was observed in this instance). Even when this practice is observed, the splitting of EM&Cs sample bottles over multiple 'analytical lots' may result in a non compliance, due to a lack of frequency of quality control samples provided to the laboratory. This reported QSC breach considered minor and not significant enough to compromise the integrety of specific batch ID.								
EN1805943	No	Yes	No	No	No	No	Yes	17/09/18
Lab Control: EP101: VOCs by USEPA Method TO15r - Recovery greater than upper control limit. Calculated Limits: 79-120%. Actual Result 122%. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Frequency of Intra Lab QC Samples: Permanent Gases and Light Hydrocarbons - Intra Lab Quality Control Sample Frequency Outliers exist. Not enough duplicate sample bags provided for intra lab duplicate and/or QC matix spike testing. This result may be due to standard laboratory practice of running samples through in grouped project 'analytical lots'. This practise may involve splitting EM&Cs submitted samples over multiple analytical lots. EM&C have no control over the number of intra lab duplicates in which their samples are analysed, other than providing additional sample bags at the specified frequency. Even when this practice is observed, the splitting of EM&Cs samples over multiple 'analytical lots' may result in a non compliance, due to a lack								

Accuracy (a quantitative measure of the closeness of the reported data to the true value)			
	Yes	No	NA
Was the field equipment calibrated?			
Comments: See Calibration Certificates Attached in Appendix E			
Have trip, field and rinsate samples been collected?			
Comments: Rinsate and trip blanks were utilised. A field blank sample was deemed to be unrequired by EM&C.			

Data Quality Indicators Checklis

Representativeness (the confidence expressed qualitatively that are representative of each media type present on the site under investigation)			
	Yes	No	NA
Has the appropriate media been sampled and analysed in accordance with the SAQP?			
Comments:			
Has all media identified in the SAQP been sampled?			
Comments:			
Have Chain of Custodies been completed?			
Comments:			
Have the samples been collected in the appropriate containers?			
Comments:			
Have the samples been stored, preserved and handled appropriately and received at the laboratory at acceptable temperature?			
Comments:			
Has any contamination been identified in blank samples?			
Comments:			
Have any uncertainties been identified in:			
Sampling methods			
Comments:			
Laboratory Methods			
Comments:			
Groundwater well integrity or network			
Comments:			
Soil vapour bore integrity			
Comments:			

Completeness (a measure of the amount of usable data contributing to the entire data set)			
	Yes	No	NA
Have all critical site locations been sampled in accordance with the SAQP?			
Comments:			
Has the Technical Holding Times been met?			
Comments:			
Is field and laboratory documentation correct, legible and authorised by signature and date?			
Comments:			

	Acceptable
	Acceptable, irragularities has been noted
	Not acceptable

Appendix E

Assessment Field Logs and Calibration Certificates

Soil Bore ID:	Site Name:	North Hobart Oval
SB1	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.08-1.1
☐ NDD		
☐ Hollow Auger		
☑ CROWBAR		0.0-0.08
☐		

Method of abandoning soil bore
- ☑ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

	Plasticity	Range of Liquid Limit
Dark Grey, Grey, Light Grey		
Dark Brown, Brown, Light Brown	Low	<35%
	Medium	>35% - <50%
	High	>50%

Particle Characteristics (Sand and Gravel Only)

W	Well Graded
P	Poorly Graded
G	Gap Graded
U	Uniform

Moisture Content: Dry, Moist, Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency	Sample ID	Bagged PID	Analysed/ QC sample ID
0.0	0.08	ASPHALT								SB1_0.1-0.2	0.0	
0.08	0.3	VC SAND	C Sand	M Gravel	SW	well graded	Dark Brown	DRY	Fill	SB1_0.2-0.3	0.0	Y/QC
0.3	0.6	M SAND	S.Lt	Clay	SM	low Plas.	Dark Brown	Dry		SB1_0.3-0.4	0.0	
0.6	1.1	VC SAND	C Sand	F Gravel	SW	well graded	light Brown	Dry		SB1_0.5-0.6	0.0	Y
										SB1_0.6-0.7	0.0	
										SB1_1.0-1.1	0.0	Y
		EOB @ 1.1 end of investigation										

Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Well Construction Details

Concrete:	-
Bentonite:	-
Sand:	-
Screen Interval:	-

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes:
Concrete
Bentonite
Sand
Well casing

DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									Rock Fragments					
	CLAY		SILT		SAND					GRAVEL			COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Oval
SB2	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

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Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.08
☐ NDD		
☐ Hollow Auger		
☑ CROW BAR	-	0.08-0.08
☐		

Method of abandoning soil bore
- ☐ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

Dark Grey, Grey, Light Grey, Dark Brown, Brown, Light Brown

Plasticity	Range of Liquid Limit
Low	<35%
Medium	>35% - <50%
High	>50%

Particle Characteristics (Sand and Gravel Only): W Well Graded; P Poorly Graded; G Gap Graded; U Uniform

Moisture Content: Dry, Moist, Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency	Sample ID	Bagged PID	Analysed/ QC sample ID
0.0	0.08	ASPHALT								SB2_0.2-0.3	0.0	Y
0.08	0.3	VC SAND	C Sand	M Gravel	SW	well Graded	Dark Brown	Dry	F.11	SB2_0.3-0.4	0.0	
0.3	0.5	M SAND	Silt	-	SM	well graded	Dark Brown	Dry		SB2_0.5-0.6	0.0	Y
0.5	0.7	M SAND	F Sand	-	SW	well Graded	Black	Dry	*			
		EOB@	0.7m	End of	investigation							

Well Development: By: ; Date: ; Method: ; Initial DTW: ; Purge Volume: ; Post purge DTW: ; Estimated recharge rate:

Well Construction Details: Concrete: -; Bentonite: -; Sand: -; Screen Interval: -

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:
*Material is very light in mass and appears to be ash from either coal or timber.

Notes: Concrete; Bentonite; Sand; Well casing
DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									GRAVEL			Rock Fragments		
	CLAY		SILT		SAND								COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Ova
SB3/SV1	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18 10/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.03
☐ NDD		
☐ Hollow Auger		
☑ CROW BAR	-	0.0-0.03
☐		

Method of abandoning soil bore
- ☐ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☑ Install soil vapour point
- ☐ Backfilled with virgin material

		Plasticity	Range of Liquid Limit
Dark Grey			
Grey			
Light Grey			
Dark Brown		Low	<35%
Brown		Medium	>35% - <50%
Light Brown		High	>50%

Particle Characteristics (Sand and Gravel Only)
- W Well Graded
- P Poorly Graded
- G Gap Graded
- U Uniform

Moisture Content: Dry / Moist / Wet

Depth (mBGS) From	Depth (mBGS) To	Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency
0.0	0.03	ASPHALT							
0.03	0.7	VC SAND	C. Sand	M. gravel	SW	Well Graded	Dark Brown	Dry	
0.7	1.0	M SAND	S. Lt	M. gravel	SM	Well Graded	Dark Brown	Dry	
		EOB @ 1.0 Refusal to Hand Auger							

Sample ID	Bagged PID	Analysed/ QC sample ID
SB3_0.4-0.5	0.0	Y
SB_0.7-0.8	0.0	
SB8_0.9-1.0	0.0	Y

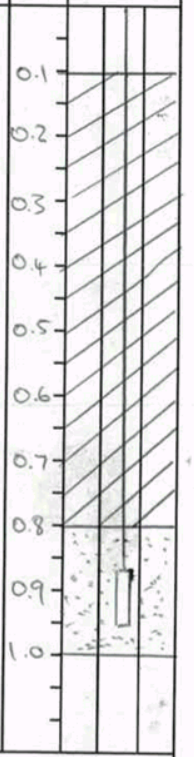
Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Vapour Point Well Construction Details

Concrete:	0.0 - 0.7
Bentonite:	0.7 - 0.8
Sand:	0.8 - 1.0
Screen Interval:	0.8 - 1.0

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction



Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes:
- Concrete
- Bentonite
- Sand
- Well casing

DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									GRAVEL			Rock Fragments		
	CLAY		SILT		SAND								COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Oval
SB4	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

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Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.08-
☐ NDD		
☐ Hollow Auger		
☑ CROW BAR	-	0.0-0.08
☐		

Method of abandoning soil bore
- ☐ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

	Plasticity	Range of Liquid Limit
Dark Grey		
Grey		
Light Grey		
Dark Brown	Low	<35%
Brown	Medium	>35% - <50%
Light Brown	High	>50%

Particle Characteristics (Sand and Gravel Only)
- W Well Graded
- P Poorly Graded
- G Gap Graded
- U Uniform

Moisture Content: Dry / Moist / Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency	Sample ID	Bagged PID	Analysed/ QC sample ID
0.0	0.08	ASPHALT										
0.08	0.3	V.C SAND	C SAND	M.GRAVEL	SW	well Graded	Dark Brown	Dry	Fill	SB4_0.2-0.3	0.0	Y
0.3	1.1	M SAND	Clay	M.Gravel	SC	well grad. low Plas.	Dark Brown	Dry	Fill	SB4_0.3-0.4	0.0	
										SB4_0.4-0.5	0.0	
1.1	1.4	M.SAND	F.Sand	-	SW	well Graded	Dark Brown	Dry		SB4_1.3-1.4	0.0	Y
		EOB @	1.4M	end of	investigation							

Well Development
- By:
- Date:
- Method:
- Initial DTW:
- Purge Volume:
- Post purge DTW:
- Estimated recharge rate:

Well Construction Details
- Concrete: -
- Bentonite: -
- Sand: -
- Screen Interval: -

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes: Concrete, Bentonite, Sand, Well casing
DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									GRAVEL			Rock Fragments		
	CLAY		SILT		SAND								COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Oval
SB5	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

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Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.1 -
☐ NDD		
☐ Hollow Auger		
☑ Crow Bar	-	0.0-0.1
☐		

Method of abandoning soil bore
- ☑ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

Dark Grey, Grey, Light Grey, Dark Brown, Brown, Light Brown

Plasticity	Range of Liquid Limit
Low	<35%
Medium	>35% - <50%
High	>50%

Particle Characteristics (Sand and Gravel Only)
- W Well Graded
- P Poorly Graded
- G Gap Graded
- U Uniform

Moisture Content: Dry, Moist, Wet

Depth (mBGS) From	Depth (mBGS) To	Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency
0.0	0.1	ASPHALT							
0.1	0.4	VC SAND	C. Sand	M. gravel	SW	well Graded	Dark Brown	DM	
0.4	0.6	M SAND	Silt	-	SM	well Graded	Pale Brown	DM	
		EOBQ	0.6m	end of investigation					

Sample ID	Bagged PID	Analysed/ QC sample ID
SB5_0.3-0.4	0.0	Y
SB5_0.5-0.6	0.0	Y

Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Well Construction Details

Concrete:	-
Bentonite:	-
Sand:	-
Screen Interval:	-

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes:
Concrete
Bentonite
Sand
Well casing
DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									GRAVEL			Rock Fragments		
	CLAY		SILT		SAND								COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

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STABILISED SOIL VAPOUR GAUGING LOG

Site Name:	North Hobart Oval	Date:	11/9/18
Site Address:	1-5 Ryde Street, North Hobart	Logged by:	Alex Lovibond
Job Number:	EMC1866		

Soil Vapour Point ID	Sample depth (m)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	LEL (%) (Octane) Methane	PID (ppm) (Isobutylene)	Sample Point Condition (rust, water in sample point cover, gatic cover, screws, gripper and rubber seal condition)	Comments
SV1_0.8-1.0	0.8-1.0	0.0	3.1	17.1	NG	NG	0.0	0.0	Good	-

Notes:

% Methane recorded by GA5000 Landfill Gas Meter considered unreliable in the presence of petroleum hydrocarbons. * Denotes meter intake connected to tail gas of purging meter and result should be interpreted with caution

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FIELD RECORD: Soil Vapour Sampling

Site Name:	North Hobart Oval		
Site Address:	1-5 Ryde Street, North Hobart	Job #:	EMC1866
Person sampling:	Alex Lovibond	Date:	11/9/18

Sample Point ID: SV1 Sample Depth Range: 0.8-1.0 mBGS.

LEAK TESTING

TEST ONE - Sample Point Permeability (using syringe)

Time	Initial air volume in syringe	Final air volume in syringe	Test Result	Comments
11.52	00	60.0		
11.53	-	60.0	PASS	Point induced no measurable Vacuum

TEST TWO - Sample Train Shut-In Test (using syringe and pressure gauge)

Time	In-line pressure (kPa)	Test Result	Comments
11.54	-56		
11.55	-56	PASS	Train holds Vacuum

TEST THREE - Helium Shroud (over soil vapour bore surface seal)

Time	Concentration in Shroud (ppm)	Concentration in Tedlar	Test results: Result is considered a pass if the concentration within the tedlar bag is less than 10% of the concentration within the shroud
12.08	9×10^6	0×10^{-4}	PASS

Sample Point Purging

Time	Purge Rate (mL/min)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (%)	H_2S (%)	LEL METHANE (%)	PID * ppm	App. pressure kPa
12.15/0.00	300ml/min	0.0	0.0	21.0	NG	NG	0.0	0.0	0.0
0.30		0.0	3.1	17.1			0.0	0.0	0.0
0.30		0.0	3.1	17.1			0.0	0.0	0.0
0.45		0.0	3.1	17.1			0.0	0.0	0.0
0.60		0.0	3.1	17.0			0.0	0.0	0.0
75		0.0	3.0	17.0			0.0	0.0	0.0
90		0.0	3.1	17.1			0.0	0.0	0.0
105		0.0	3.1	17.0			0.0	0.0	0.0
120	↓	0.0	3.1	17.1	↓	↓	0.0	0.0	0.0

Vapour purging gas Meter used: GFM430 10380	Date of Calibration: 6/9/18
Helium meter used: Ion gascheck 14-01371	Date of Calibration: 22/8/2018
Sample tube type: □SS ☑Teflon □Nylon □.....	**Sample probe type:** ☑SS implant □SS wool □.....

SAMPLING

Time sampling begin: 12.30	Time sampling finished: 13.06
Initial pressure in suma canister(s): NA	Final pressure in suma canister(s): NA
Primary Sample Suma canister ID: NA	Duplicate / Split Sample suma canister ID: NA
Sampling Train ID: NA	Flow restrictor flow rate: NA

* Denotes field meter intake was connected to tail gas of purging meter and results should be interpreted with caution
Typical flow rate through GA5000 Landfill Gas Meter is 550ml/min
% Methane recorded by GA5000 Landfill Gas Meter considered unreliable in the presence of petroleum hydrocarbons
% LEL recorded by ImpactPRO (four gas meter) considered unreliable once the % of oxygen falls below 10%.
Flow rate during purging or sampling should not exceed 8inHg (27kPa) to prevent the desorption of petroleum hydrocarbons from soil (CRC CARE TR.23)

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CALIBRATION CERTIFICATE

Make: Honeywell	Calibration Date: 2/7/18
Model: Impact Pro	Machine Reading: Calibration Due in 180 days
Serial No: ZEL1201176	Next Calibration Date: 28/12/18
Calibration Gas Supplier:	ThermoFisher Scientific
Calibration Gas ID:	Lot 440392, Cyl 18
Calibration Gas Expiry Date:	June 2019
Calibration Gas Composition:	ISOBUTYLENE 100 ppm C_4H_8

Calibration Method

Unit calibrated in accordance with MiniRAE Operating Instructions and Maintenance Manual (the 'user manual').

Method of calibration: Per section 4.4 of the user manual

Post calibration bump test reading of Calibration Gas

Isobutylene	Expected	Result
	100	100

Calibration completed by:
Simon Chislett
Competency: Gas Test Atmosphere, Course Code: MSAPMOHS217A

Signature

Date of Issue: 02/07/18

Air-Met Scientific P/L
7-11 Ceylon Street
Nunawading
Victoria 3131, Australia

Calibration Certificate

This document hereby certifies that this instrument detailed has been calibrated to the parameters listed below.

Certificate Print Date: 22 August, 2018
Calibration Date: 22 August, 2018
Next Calibration Due: 22 August, 2019

Call ID: 00221730

Job / SO Number: 232364

Customer: AMS Brisbane Rental **Type:** Misc

Model: Miscellaneous **Serial No:** 14-01371

Description: GasCheck 5000

Sensor	Date Code	Gas Bottle No.	Calibration Gas and Concentration	C.F	C.V	Instrument Readings Certified	Before / Span Res.	After
Helium Leak	//	1063ME	HELIUM - HIGH PURITY 99.9% (Leak 5E-4cc/sec)			ION S	5E-4cc/s	5E-4cc/se
	//							
	//							
	//							
	//							
	//							

Completed by: *Kyle Reardon* **Signed:**

Australian Standard Alarm Levels ☐

CF - Conversion Factor, CV Compensated Value
CV = CF * Span Gas

6/9/18

Gas Calibration Certificate

Instrument GFM430
Serial No. 10380
Sensors CH4, CO2, O2,H2S,CO

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
Pump	Operation		
	Filter		
	Flow		
	Valves, Diaphragm		
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	CH4	✓	
	CO2	✓	
	O2	✓	
	H2S	✓	
	CO	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version		
Datalogger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
Oxy		20.90%		Fresh Air	20.90%
CO2		40.0%	NIST	ME420	40.0%
CH4		60.0%	NIST	ME420	60.0%

Calibrated by: **Ariane Ventura**

Calibration date: **6/09/2018**

Next calibration due: **8/03/2019**

Appendix F

GIAP Search Results

EM&C executed GIAP search for area surrounding the Site indicating no registered nearby groundwater wells.

Appendix G

CRC CARE Soil Vapour Checklists L and K

CRCCARE

Checklist for Reviewing
Soil Vapour Data

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Checklist for Reviewing Soil Vapour Data					
Report ID	**Report Description**				**Report Issue Date**
EN1805943	Soil Vapour Sampling - September 2018				17/09/18
	Acceptable		Acceptable, irragularities have been noted		Not acceptable

Sample Collection	Yes	No	NA
Active Soil Vapour Data			
Did the probe rod have an internal inert tube (SS, Teflon, nylon)?			
Comments: - Teflon			
Was the probe reused? If so was it adequately decontaminated between samples?			
Comments: - New stainless steel sample probes were used at the time of SV point installation.			
Were at least 3 dead volumes of the probe purged?			
Avoid excessive purging, unless field screening (O2, CO2, PID or FID and tracer gas) conducted to demonstrate absence of atmospheric air intrusion.			
Comments: See field screening logs attached.			
Did the field screening of PID, O2 and CO2 provide results consistent with those expected based on sample location (in relation to contamination), depth and soil type? Are the results consistent with the CSM (in particular parameters that relate to and support biodegradation processes)?			
Comments: Results align with expectations			
Were samples collected deep enough to minimise air infiltration?			
Comments: -			
Did it rain shortly before the sampling event?			
Soil vapour sampling should be avoided following significant precipitation			
Generally there is no consensus on how much rain can fall or how much time should elapse before taking samples. It depends on soil type, ground surface cover, amount of rain and previous soil moisture content. As a general guide sampling from wells in open ground (not beneath buildings or concrete pavement) should occur 3-7 days after 25mm rainfall has occurred within an approximate 24 hour time period.			
Comments: -			
Was a reliable method used to ensure the absence of atmospheric air leakage?			
Tracer compound used to demonstrate no leakage down or around probe and at all sample train fittings.			
Comments: Helium tracer compound utilised and analysed during field leak detection procedures as well as within laboratory analysed samples. See Soil Vapour QA/QC table attached to report.			
Were samples collected in appropriate containers for the chemicals of concern?			
Comments: -			
If canisters were used, was each canister certified clean or batch tested?			
Comments: Tedlar bags used			
Were dedicated flow controllers & sample trains used for each sample?			
It is not recommended that flow controllers and sample trains are re-used. Cleaning of these components in the field has been sown to be ineffective and the re-use of such equipment can result in cross-contamination.			
Comments: New sterile syringe used			

CRCCARE

Checklist for Reviewing
Soil Vapour Data

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	Yes	No	NA
Were vacuum pumps used in the sample collection? If so, did the flow rate decrease because of resistance to flow?			
Comments: -			
Were excessive vacuums required to obtain a sample?			
>100 inches of H_20 (~8 inches of Hg) should be avoided			
Comments: -			
Were samples collected upstream of the vacuum pump (where used)?			
Comments: -			
Was the sample flow rate through the sorbent tubes monitored and reported throughout the sampling period?			
Comments: -			
For canisters, were samples stored at ambient air temperature?			
Comments: -			
For sorbent tubes, were these stored and shipped at <4°C			
Comments: -			
Were samples analysed within recommended holding times?			
Comments: -			
Passive Soil Vapour Programs			
Were method and trip blanks analysed?			
Needed to show absence of contaminants from lab or transportation back and forth to site			
Comments:			
Were samplers left in the ground for consistent and sufficient time?			
Generally a few days to 2 weeks (unless in an area with very high levels being sampled).			
Collected in same sequence as deployed			
Comments: -			
Were duplicate samples collected and how do they compare?			
Comments: Active sampling was conducted, however, the primary quality control duplicate leaked during transit to the laboratory meaning that it could not be analysed, see DQI checklist and QA/QC report			
Are data used appropriately?			
For what purpose?			
Were active soil vapour samples collected for comparison?			
How well do passive and active samples compare?			
Comments: Active samples taken, therefore this question is irrelevant.			
Could measured values be from infiltration of contaminated atmospheric air or from volatiles emitted from an overlying surface (e.g., asphalt, dirty soil)? (i.e. is there a chance of cross contamination from the environment?)			
Comments:			
Are relative concentrations of compounds detected consistent with expectations from other media (soil vapour, groundwater, bulk soil)?			
Comments: -			

Checklist for Reviewing
Soil Vapour Data

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Yes	No	NA
Were the passive samplers stored and shipped at <4°C			
Comments: -			
Were samples analysed within recommended holding times?			
Comments: -			
Sample Analysis			
The following questions should be asked when examining the analysis of any type of soil vapour sample: active or passive.			
Active and Passive Soil Vapour Samples			
What methods are being used? Can they detect the target compounds at the required levels of sensitivity?			
Comments: EP101 N5G and EP104			
Have the method required calibration standards been analysed?			
Comments: -			
Are the reported values within the documented calibration range of the instrument?			
Comments: -			
Are any compounds co-eluting?			
Comments: For GCMS analyses such as that carried out on these samples (EP101 codes), there are two situations and reporting protocols that may apply for co-eluting compounds, as follows; 1. When 2 (or more) compounds co-elute and cannot be separated on the basis of their MS fragmentation ions, they are reported together, for example in this assessment "meta- & para- Xylene" co-eluted and have been reported together. 2. When 2 (or more) compounds co-elute and they can be separated on the basis of their MS fragmentation ions without interference effects, they are reported as the individual components. In this situation there is generally no need to comment and data quality is not impacted For GC-FID or GC-TCD analyses (such as the gas analysis EP104), only the first of these two examples apply, as there is no MS spectrum. Any compounds that co-elute for this analysis will be reported together, which in this case has not occured.			

CRCCARE

Checklist for Reviewing Soil Vapour Data

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

		Yes	No	NA
Have the method required QA/QC samples been analysed (blanks, duplicates, etc.)				
Laboratory Duplicates	The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.			
Method Blank	The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination.			
Laboratory Control Spike	The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.			
Matrix Spike	The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.			
Are the calibration standards within method required holding times and traceable to a certified source?				
Comments: See attached documentation				
In what units are the data reported (µg/l, µg/m3, ppbv, ppmv)?				
Comments: $\mu g/m^3$				
For high concentrations, have large dilutions been performed and do these affect the interpretation of the results? (i.e. are the detection limits above the adopted screening values for the PHCs evaluated?)				
Comments: -				
Passive Soil Vapour Samples				
In addition to the analytical issues summarised above, the following issues should be examined with passive soil vapour samples:				
How are the samples desorbed from the collector?				
Comments:				
Is the desorption process quantitative and does it fractionate?				
Comments:				
What units are the data reported in (mass etc.)?				
Comments:				

CRCCARE

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments							
Report ID	**Report Description**					**Report Issue Date**	
EN1805943	Soil Vapour Sampling - September 2018					17/09/18	
	Acceptable		Acceptable, irragularities have been noted			Not acceptable	
Critical Issue and Assessment Steps							
						Relevant at Site?	Addressed in Report Section #
						Yes	**No**
Objectives of the PVI assessment							6
Comments:							
Determination of whether there is contamination present							
LNAPL							NA
Comments: Groundwater assessment has been excluded from the assessment							
Contaminated groundwater (dissolved phase)							NA
Comments: Groundwater assessment has been excluded from the assessment							
Contaminated Soil							9.2
Comments:							
If none of the above factors are relevant for the site - Site ruled out from needing further assessment as no relevant contamination present at site							
Development of Sufficient CSM (meets minimum requirements from Table 1 of PVI guideance)							
Source of contamination identified							3
Comments: Previous onsite and adjacent contaminating industry							
Nature and extent of contamination identified							9.2
Comments:							
Geology described							5.4
Comments:							
Hydrogeology described							5.5
Comments:							
Zone of influence established							9.2
Comments:							
Buildings and uses present							1
Comments:							
Buildings and uses proposed							1
Comments:							
Evaluation of whether short-term/acute risks are present							9.2
Comments:							
Auditor/regulator notified of short-term/acute risks and rectification actions developed							NA
Comments:							

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Relevant at Site?		Addressed in Report Section #
	Yes	No	
Contamination in direct contact with existing or proposed building foundations			9
Comments:Sampled soil is will be in contact with proposed building footings			
Review and use of HSLs - Where applicable, are concentrations above HSLs			9.2
Comments:			
Review and use of screening distances - Where applicable is the distance between contamination and receptors/building foundation greater than the screening distances?			NA
Comments:			
Site ruled out from needing further assessment as vapour intrusion is not significant as determined through appropriate use of HSLs or screening distances (unless preferential pathways present)			
Preferential pathways present			NA
Comments:			
Where contamination is in contact with foundations, modelling of indoor air concentrations from seepage indicates potential risk			NA
Comments: Direct PVI assessment conducted in preference to modelling			
Where contamination is not in contact with foundations, modelling of indoor air concentrations from groundwater using J&E (or equivilent) indicates a potential risk			NA
Comments: soil vapour data gathered in preference to modelling			
Collection of vapour data			
Soil gas samples taken to provide evidence of level of risk			9.4
Comments:			
Soil gas samples collected from appropriate locations and depths			9.4
Comments:			
Soil gas samples collected from representative conditions			9.4
Comments: Soil vapour sample collected at a depth below the projected excavation extent, representing conditions directly below the proposed finished ground surface.			
Soil gas samples collected in accordance with Box 5.4 of PVI Guidance (also ref App K)			6
Comments: See SAQP			
Crawl space samples taken to provide evidence of level of risk			NA
Comments:			
Crawl space samples collected from appropriate locations and over appropriate period of time			NA
Comments:			
Crawl space samples collected in accordance with Box 5.5 of PVI guidance			NA
Comments:			
Indoor air samples taken to provide evidence of level of risk			NA
Comments:			
Air samples collected from appropriate locations and over appropriate period of time			NA
Comments:			

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Relevant at Site?		Addressed in Report Section #
	Yes	No	
Air samples collected in accordance with Box 5.5 of PVI guidance			NA
Comments:			
Evaluation of vapour data			
Is the data of suitable quality to use in the assessment (QA/QC evaluation)			9.5
Comments:			
Is there sufficient data for making robust conclusions			9.5
Comments:			

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Appendix B

Smeeks Drafting Plans

GENERAL NOTES:

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SMEEKES DRAFTING PTY LTD STANDARD BUILDING NOTES, SHEETS STANDARD-001 TO 008.
2. WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALE.
3. BUILDER TO VERIFY ALL BOUNDARY CLEARANCES AND SITE SET-OUT DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ALL CONSTRUCTION WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND RELEVANT AUSTRALIAN STANDARDS.
5. TIMBER FRAMING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 1684.2 "TIMBER FRAMED CONSTRUCTION". T.P. DECK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLICATION FROM THE TIMBER PROMOTION COUNCIL " TIMBER DECKS - DESIGN AND CONSTRUCTION MANUAL".
6. FOOTINGS AND SLABS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 2870 "RESIDENTIAL SLABS AND FOOTINGS".
7. PLUMBING AND DRAINAGE SHALL BE IN ACCORDANCE WITH AS 3500.2 AND AS 3500.3 "THE NATIONAL PLUMBING AND DRAINAGE CODE". FIT ADJUSTABLE TEMPERING VALVES TO ALL ABLUTIONS IN ACCORDANCE WITH AS 1529 "CODE OF PRACTICE OF HOUSEHOLD TYPE HOT WATER SUPPLY SYSTEMS".
8. WATER PROOFING OF WET AREAS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 3740 "WATERPROOFING OF WET AREAS IN RESIDENTIAL BUILDINGS".
9. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 3000 "WIRING RULES". SMOKE ALARMS SHALL BE INSTALLED IN ACCORDANCE WITH TASMANIAN FIRE SERVICE AND AS 3786 "SMOKE ALARMS".
10. GLAZING SHALL BE IN ACCORDANCE WITH AS 1288 "GLASS IN BUILDINGS - SELECTION AND INSTALLATION", WINDOWS TO COMPLY WITH AS 2047 "WINDOWS IN BUILDINGS - SELECTION AND INSTALLATION".
11. MIN. R6.0 INSULATION TO CEILING. MIN. R2.5 INSULATION TO ALL EXTERNAL WALLS.
12. ALL STEELWORK SHALL BE IN ACCORDANCE WITH AS 4100 "STEEL STRUCTURES".

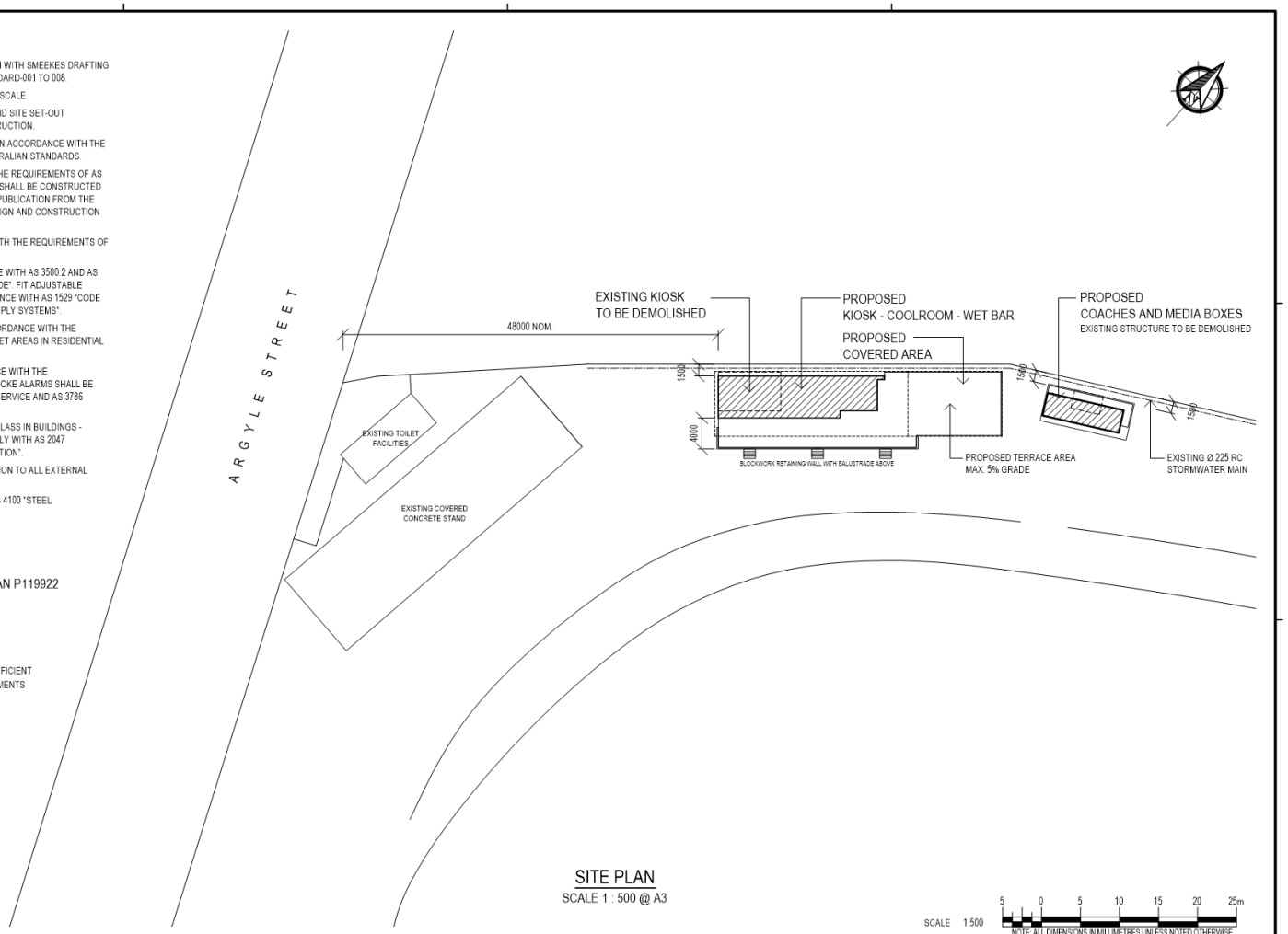
SITE DATA:

LAND TITLE REF. No.	: LOT 1 ON PLAN P119922
CLIMATE ZONE	: ZONE 7
DESIGN WIND SPEED	: 'N3'
SOIL CLASSIFICATION	: 'TBA'
BAL RATING	: BAL-LOW

THE RISK IS CONSIDERED TO BE VERY LOW (THERE IS INSUFFICIENT RISK TO WARRANT ANY SPECIFIC CONSTRUCTION REQUIREMENTS BUT THERE IS STILL SOME RISK.)

SITE COVERAGE:

LOT SIZE	: 35070.00 m²
KIOSK FOOTPRINT	: 106.90 m²



SITE PLAN
SCALE 1 : 500 @ A3

SCALE 1:500 — 5 0 5 10 15 20 25m

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

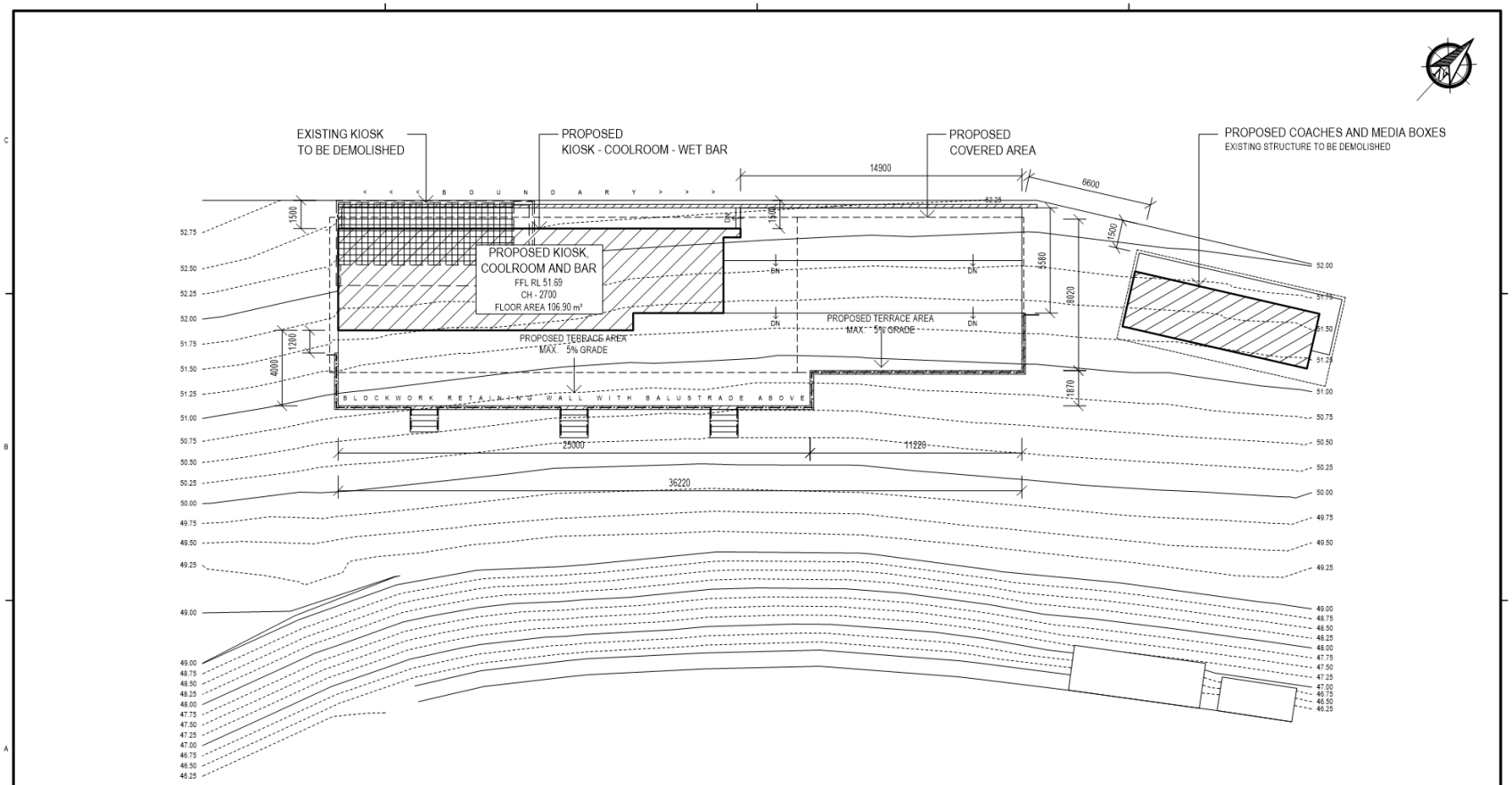
SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

SITE PLAN

ORG No.	SHT.	SCALE	
NHO_K	001	1 : 500	A3



PART SITE PLAN
SCALE 1 : 200 @ A3

SCALE 1:200
2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
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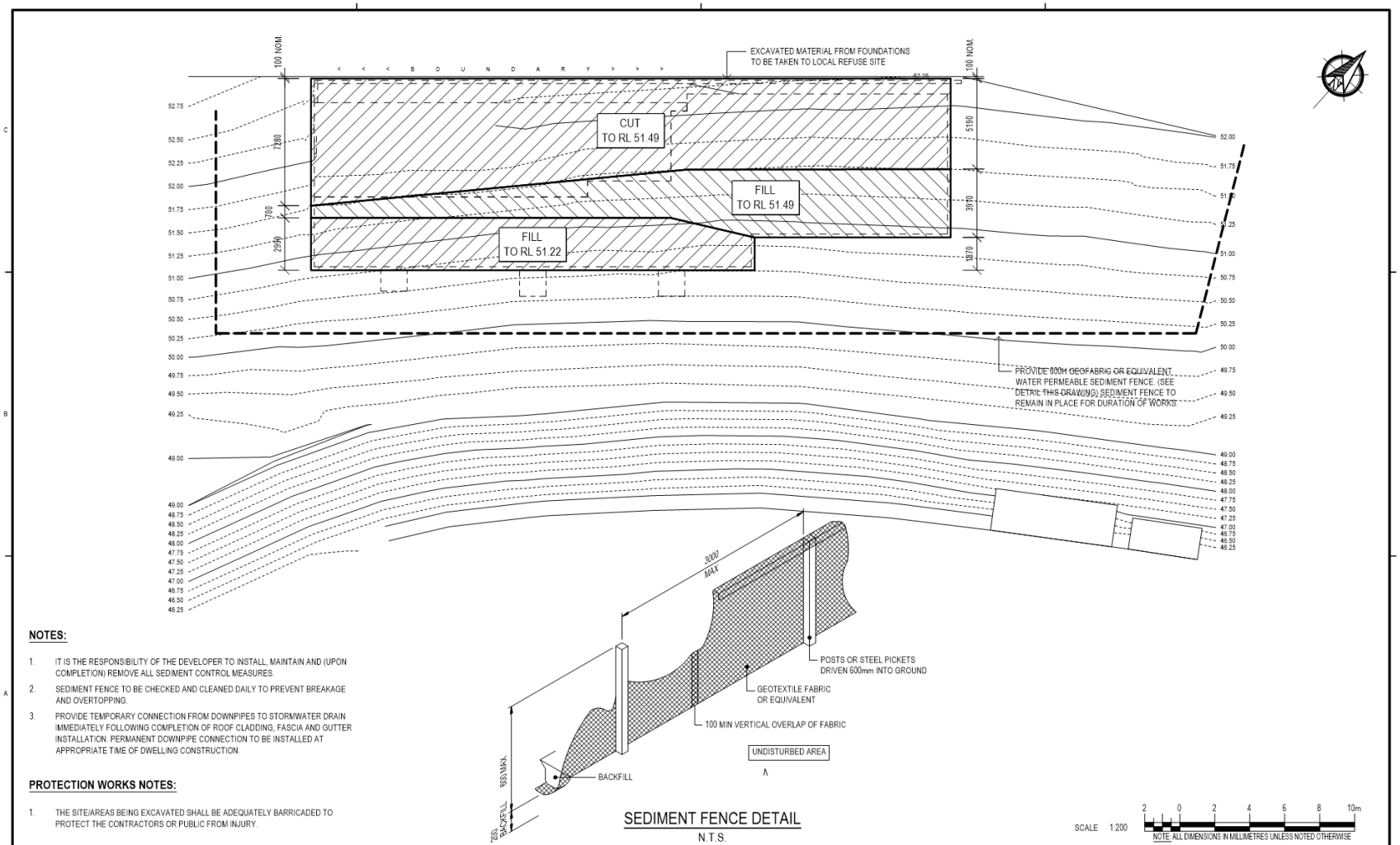
CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

PART SITE PLAN

ORG No.: NHO_K | SHT.: 002 | SCALE: 1 : 200 | A3



SEDIMENT FENCE DETAIL

N.T.S.

NOTES:

1. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL, MAINTAIN AND (UPON COMPLETION) REMOVE ALL SEDIMENT CONTROL MEASURES.
2. SEDIMENT FENCE TO BE CHECKED AND CLEANED DAILY TO PREVENT BREAKAGE AND OVERTOPPING.
3. PROVIDE TEMPORARY CONNECTION FROM DOWNPIPES TO STORMWATER DRAIN IMMEDIATELY FOLLOWING COMPLETION OF ROOF CLADDING, FASCIA AND GUTTER INSTALLATION. PERMANENT DOWNPIPE CONNECTION TO BE INSTALLED AT APPROPRIATE TIME OF DWELLING CONSTRUCTION.

PROTECTION WORKS NOTES:

1. THE SITE/AREAS BEING EXCAVATED SHALL BE ADEQUATELY BARRICADED TO PROTECT THE CONTRACTORS OR PUBLIC FROM INJURY.

SCALE 1:200 — 2 0 2 4 6 8 10m

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
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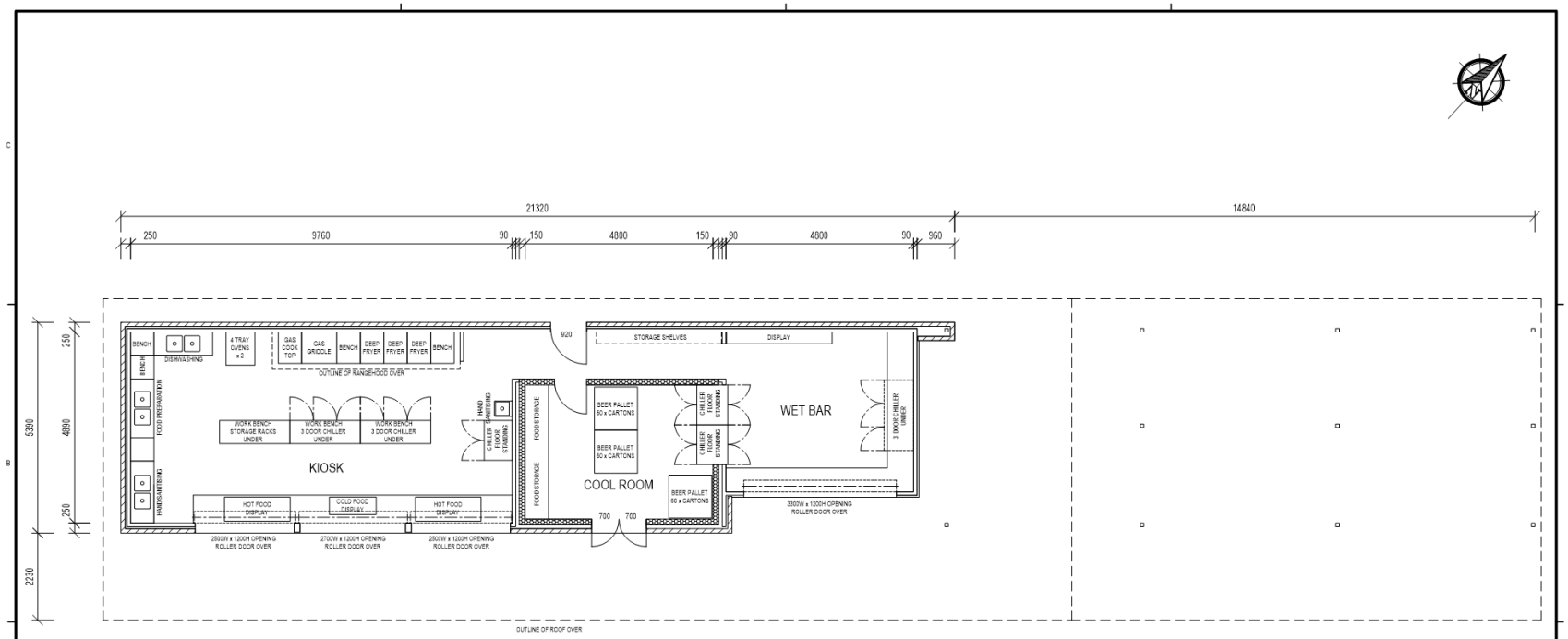
CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
CUT AND FILL PLAN /
SOIL AND WATER MANAGEMENT PLAN

ORG No.	SHT.	SCALE	
NHO_K	003	1 : 200	A3



FLOOR PLAN

SCALE 1 : 100 @ A3

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

A - AWNING
BF - BIFOLD DOOR
C - CUSTOM (BUTTED CORNER GLAZING)
F - FIXED
FR - FROSTED GLAZING
GB - GLASS BRICK
H - HINGED DOOR
S - SLIDING
SD - SLIDING DOOR
STKSD - STACKING TYPE SLIDING DOOR

FLOOR FINISHES LEGEND:

C - CARPET
CT - CERAMIC TILES
L - LINOLEUM
NC - NATURAL CONCRETE

SCALE 1:100 — 1000 0 1000 2000 3000 4000 5000mm

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2016

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
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Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
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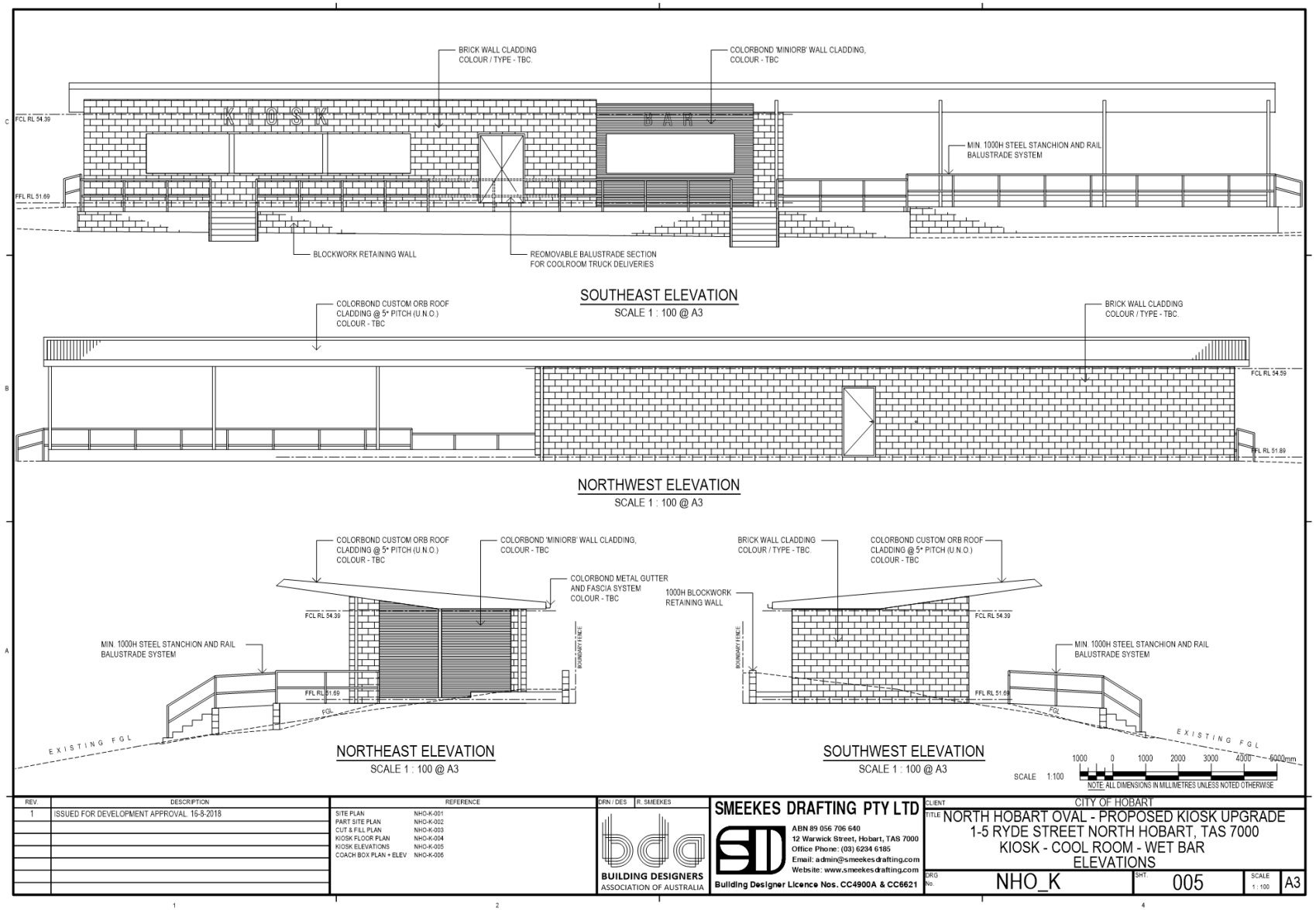
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
FLOOR PLAN

DRG No.	SHT.	SCALE	
NHO_K	004	1 : 100	A3



REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

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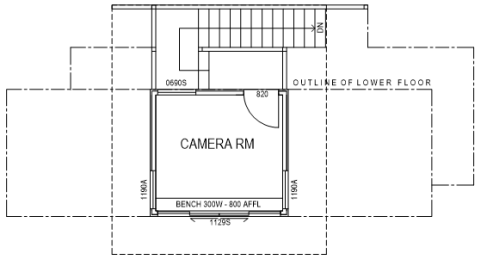
CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
ELEVATIONS

ORG No.	SHT.	SCALE	
NHO_K	005	1 : 100	A3



LEVEL 2 (CAMERA ROOM) FLOOR PLAN
SCALE 1 : 100 @ A3

FLOOR FINISHES LEGEND:

- C - CARPET
- CT - CERAMIC TILES
- L - LINOLEUM
- NC - NATURAL CONCRETE

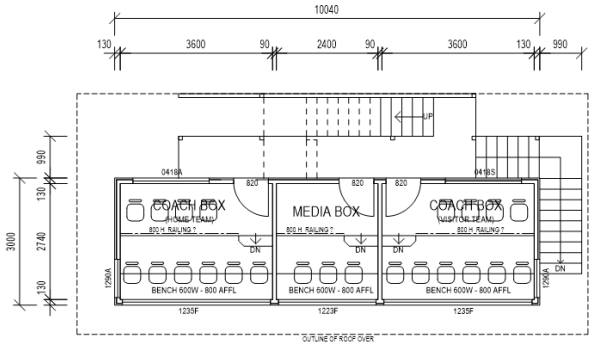
WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

- A - AWNING
- BF - BIFOLD DOOR
- C - CUSTOM (BUTTED CORNER GLAZING)
- F - FIXED
- FR - FROSTED GLAZING
- GB - GLASS BRICK
- H - HINGED DOOR
- S - SLIDING
- SD - SLIDING DOOR
- STKSD - STACKING TYPE SLIDING DOOR

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.



LEVEL 1 (COACHES + MEDIA) FLOOR PLAN
SCALE 1 : 100 @ A3

SCALE 1:100

1000 0 1000 2000 3000 4000 5000mm

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
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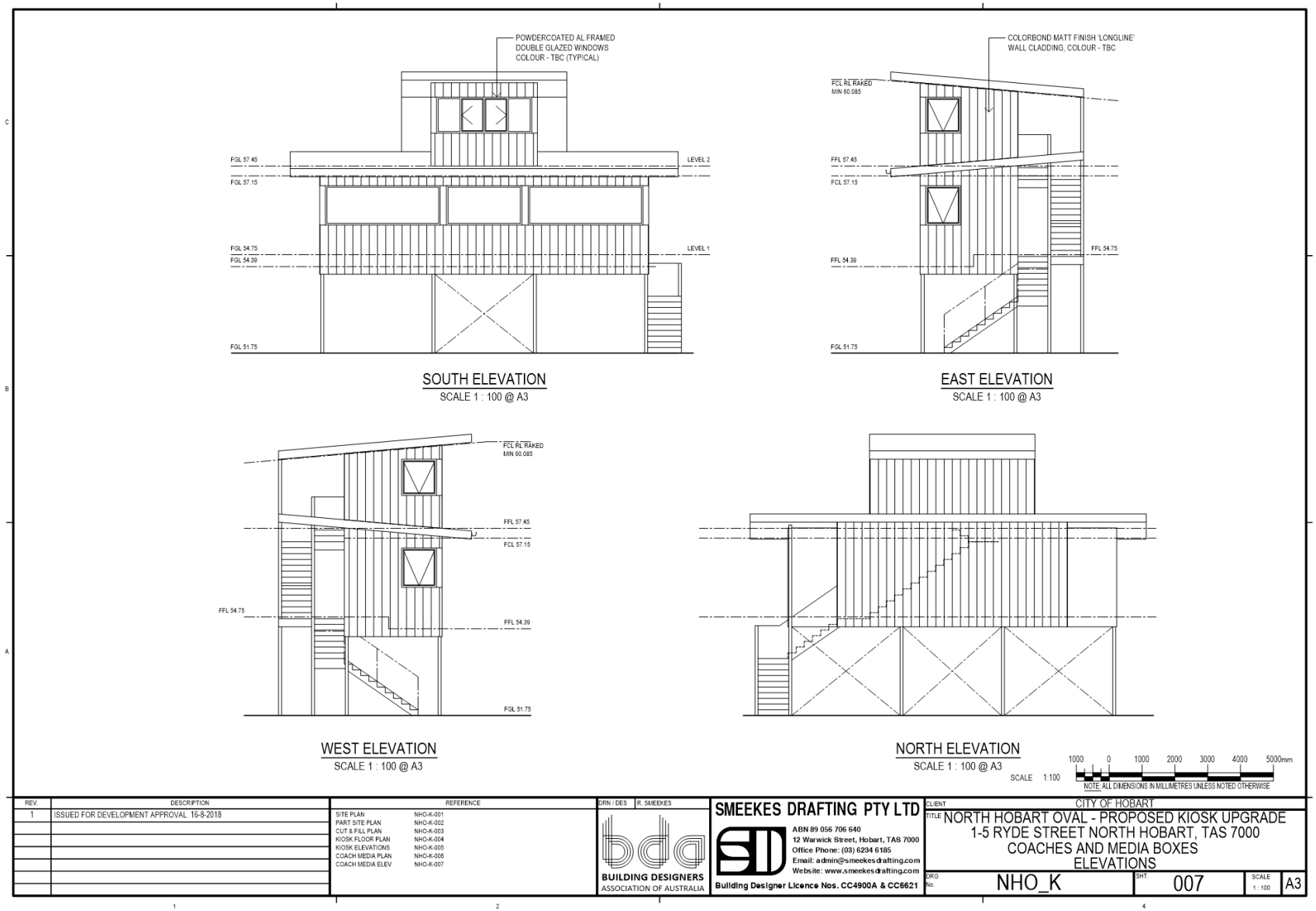
CLIENT CITY OF HOBART

TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
FLOOR PLANS

ORG No. NHO_K | SHT. 006 | SCALE 1 : 100 | A3


POWDERCOATED AL FRAMED DOUBLE GLAZED WINDOWS COLOUR - TBC (TYPICAL)
FGL 57.45
FGL 57.15
FGL 54.75
FGL 54.39
FGL 51.75
LEVEL 2
LEVEL 1
SOUTH ELEVATION
SCALE 1 : 100 @ A3
COLORBOND MATT FINISH 'LONGLINE' WALL CLADDING, COLOUR - TBC
FCL RL RAKED MIN 60.085
FFL 57.45
FCL 57.15
FFL 54.39
FFL 54.75
FGL 51.75
EAST ELEVATION
SCALE 1 : 100 @ A3
FCL RL RAKED MIN 60.085
FFL 57.45
FCL 57.15
FFL 54.75
FFL 54.39
FGL 51.75
WEST ELEVATION
SCALE 1 : 100 @ A3
NORTH ELEVATION
SCALE 1 : 100 @ A3
SCALE 1:100
1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE
REV. 1
DESCRIPTION: ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018
REFERENCE
SITE PLAN NHO-K-001
PART SITE PLAN NHO-K-002
CUT & FILL PLAN NHO-K-003
KIOSK FLOOR PLAN NHO-K-004
KIOSK ELEVATIONS NHO-K-005
COACH MEDIA PLAN NHO-K-006
COACH MEDIA ELEV NHO-K-007
DRN / DES R. SMEEKES
BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA
SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
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Building Designer Licence Nos. CC4900A & CC6621
CLIENT CITY OF HOBART
TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
ELEVATIONS
DRG No. NHO_K
SHT. 007
SCALE 1 : 100
A3

LEVEL 2 BIGGINS BLD. NORTH HOBART TAS p. 03 6231 5979 e. enquiry@enviromac.com.au w. enviromac.com.au

Report Prepared for:

North Hobart Football Club

Prepared by:

Environmental Management & Consulting Pty Ltd

ABN: 17 273 533 294

Office/ Mail: Level 2, 67 Letitia St, North Hobart 7000, Tasmania

Assessment Design, Project Supervision and Report Prepared by:	**Simon Chislett** Principal Environmental Engineer, B.Eng (Env) Hons Environmental Management & Consulting Pty Ltd Certified Environmental Practitioner, Contaminated Site Specialist (CEnvP CS, EIANZ) EIANZ Certified Environmental Practitioner No: 1160 EIANZ Site Contamination Specialist No: SC400112 Email: simon@enviromac.com.au
Field work completed by:	**Alex Lovibond,** Senior Environmental Scientist, B.Sc (Env), LLB (Env) Environmental Management & Consulting Pty Ltd **Tom Latham,** Environmental Engineer, B.Eng (Hons) Civ. & Env, Environmental Management & Consulting Pty Ltd

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em&c
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LIST OF COMMON REPORT ABBREVIATIONS

ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Above-ground Storage Tank
B(a)P	Benzo(a)Pyrene
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CARE	Contamination Assessment and Remediation of the Environment
COC	Chain Of Custody
COPC	Contaminants Of Potential Concern
CRC	Cooperative Research Centre
DO	Dissolved Oxygen
DQO	Data Quality Objective
DNAPL	Dense Non-Aqueous Phase Liquid
DSI	Detailed Site Investigation
DTW	Depth to Water
EC	Electrical Conductivity
EIL	Ecological Investigation Level
EM&C	Environmental Management & Consulting Pty Ltd
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
EPA	Environment Protection Authority
HIL	Health Investigation Level
HSL	Health Screening Level
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit Of Reporting
MAH	Monocyclic Aromatic Hydrocarbons
mBGS	Metres Below Ground Surface
mTOC	Metres below Top of Casing
NEPM	National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PH	Petroleum Hydrocarbon
PID	Photo-Ionisation Detector
PSI	Preliminary Site Investigation
PVI	Petroleum Vapour Intrusion
RPD	Relative Percentage Difference
SAQP	Sample Analysis and Quality Plan
TDS	Total Dissolved Solids
TOC	Top Of Casing
TPH/ TRH	Total Petroleum Hydrocarbons/ Total Recoverable Hydrocarbons
UST	Underground Storage Tank
VOC	Volatile Organic Compound
QA/QC	Quality Assurance/ Quality Control

List of Abbreviated Measurement Units

m: metre	L: Litre	ppm: parts per million
km: kilometre	kL: kilolitre	ppb: parts per billion
mg/kg: milligram/ kilogram	mg/L: milligram/ litre	
µg/kg: microgram/ kilogram	µg/L: microgram/ litre	

1. INTRODUCTION

This Preliminary Environmental Site Assessment (PESA) report has been prepared by Environmental Management & Consulting Pty Ltd (EM&C) to enable the Hobart City Council (HCC) to assess the proposed development for 1-5 Ryde Street, North Hobart (the 'site') against the provisions of the Potentially Contaminated Land Code (PCLC) – E2.6.2 of the Hobart Interim Planning Scheme 2015. The location of the site within the suburb of North Hobart and state of Tasmania is shown on attached Figure 1.

A copy of the architectural drawings for the proposed development have been provided to EM&C for consideration and are included for reference within Appendix A. In summary, the proposed development for a 'kiosk upgrade' is for the demolition and re-construction of a kiosk building, which will include a commercial kitchen, cool room, wet bar and outdoor partially covered terrace area. The combined excavation area is expected to be approximately 189m^2 and the expected infill area is expected to be approximately 187m^2. An additional area within the site, the existing coaches and media box is proposed to be demolished, and replaced with a new building, retaining the original building purpose.

EM&C have designed this assessment based on the supplied cut and fill plan provided by Smeekes Drafting Pty Ltd (Drawing number NHO_K 003, included in Appendix A). During the proposed development, the planned excavation is confined to the proposed kiosk upgrade area, to the exclusion of the coaches and media box. As a result, the soil assessment area has been confined to the kiosk area accordingly. This approach is justified based on the purpose of the Potentially Contaminated Land Code (PCLC) provided within the Hobart Interim Planning Scheme 2015 as to:

> *Ensure that use or development of potentially contaminated land does not adversely impact on human health or the environment.*

The area of proposed disturbance is shown in red hatched shading on attached Figure 1 and 2 and is also the area of investigation by this PESA report.

2. OBJECTIVE

This PESA has been designed to address the requirements provided within the PCLC, to determine if the proposed development *works involving excavation of potentially contaminated land…* [will] *…adversely impact on health and the environment.*[1]

The objectives of the completed PESA were to determine:

- Whether any site contamination presents a risk to workers involved in redevelopment of the site, or future users of the site, as a result of proposed excavation of the site.
- Whether any site contamination presents an environmental risk from excavation conducted during redevelopment of the site.

[1] PCLC E2.6.2, Hobart Interim Planning Scheme 2015

- Whether any specific remediation and/or protection measures are required to ensure the proposed excavation does not adversely impact human health or the environment before excavation commences.
- If offsite disposal of soil is required, classify the soil within the definitions provided within the Tasmanian EPA publication *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal.*

3. APPLICATION OF WORSCOPE TO PLANNING SCHEME

This assessment seeks to assess the condition of the site against the performance criteria supplied within the planning scheme, along with HCCs anticipated request for such an assessment.

The proposed excavation at the site triggers the application of the Potentially Contaminated Land Code. Section E2 of the HCC Interim Planning Scheme 2015 identifies where the PCLC applies:

E2.2.1

This Code applies to:

(a) a use, on potentially contaminated land, that is a sensitive[2] use, or a use listed in a use class in Table E2.2.1 and is one of the uses specified as a qualification; or
(b) development on potentially contaminated land.

Development is further defined within Section E2.6 to include either subdivision or excavation. The extent of excavation required to trigger the application of the PCLC through development is limited by Section E2.4.4, to only apply when the area of land disturbed by the development exceeds one square meter.

The code defines potentially contaminated land within Part E2.3.1:

...land that is, or adjoins land that the applicant or the planning authority:

a. Knows to have been used for a potentially contaminating activity by reference to: -
    i. A notice issued in accordance with Part 5A of the *Environmental Management and Pollution Control Act* 1994; or
    ii. A previous permit; or
b. Ought reasonably to have known was used for a potentially contaminating activity.

A list of potentially contaminating activities is provided within the planning scheme within Table E2.2.

The requirement for assessment was triggered by:

---

[2] Sensitive means a residential use or a use involving the presence of people for extended periods except in the course of their employment, such as in a caravan park, childcare centre, dwelling, hospital or school. *Hobart Interim Planning Scheme 2015 - Administration*

- The proposed area of excavation is estimated to be approximately 189m^2 for the construction of a new kiosk building (area of disturbance shown on attached Figures 1 and 2).
- The identification by HCC of the following potentially contaminating activities occurring on the neighboring site, located at 373 Argyle Street, North Hobart. A copy of correspondence with Hobart City Council is included within Appendix B.
    - Brick manufacture – the property was once known as 'Brickfield' and operated as a brick kiln from 1816 until approximately 1850[3].
        - The use of kilns on the Brickfield site to fire bricks satisfies the requirements of defining the site as potentially contaminated land under the PCLC.
        - Records recovered, and included within Appendix B, from the National Library of Australia (TROVE)[4] have confirmed the location of the 'Brickfield' site. Maps dating from 1836 and 1849 indicate that both 393 Argyle Street and the Site are situated within the area identified as Brickfields.
        - Based on the recovered maps, it appears as though the Brickfields property extended from Argyle to Letitia street (west to east) and present day Wignall and Lewis Streets (south to north), meaning that the potentially contaminating activity identified by HCC not only occurred on 393 Argyle Street, but also the Site (1-5 Ryde Street).
    - Landfilling operations – the property was used as a landfill for an unspecified duration.[5]
        - The use of a site as a landfill satisfies the requirements of defining the site as potentially contaminated under the PCLC.
    - Dangerous goods registration forms received from the Department of Justice are included within Appendix B. The records indicate that dangerous goods were kept at the site, however the dangerous goods appear to have been restricted to bottled liquified petroleum gas, and therefore do not pose a significant risk of contamination to the site.
    - Records (included within Appendix B) received from the Tasmanian Environmental Protection Authority (EPA) have identified that they have no records relating to contamination or potentially contaminating activities being carried out on the site. The Property Information Request (PIR) carried out by the Tasmanian EPA identified:
        - Several underground storage tanks (USTs) have been registered within a 150m radius of the site. These tanks are located at:
            - 27-29 Federal Street (1963-1985)

[3] See email correspondence with HCC within Appendix B. Years of operation was communicated to EM&C over the phone following the emailed response.

[4] Maps provided within Appendix B.

[5] See correspondence with HCC contained within Appendix B.

- 31 Federal Street (1972-1986)
- 37-41 Federal Street (1986)
- 49a-53 Federal Street (1974-1977)
- 396 Argyle Street, Units 1 & 2 (1972-1984)

▪ None of these sites share a property boundary with 1-5 Ryde Street, and therefore do not trigger the provisions of the PCLC, however, EM&C consider the property located at 396 Argyle Street may have potentially contributed to onsite contamination (if found) due to its position up topographical, and potentially hydrological gradient of the investigation area.

4. ASSESSMENT FRAMEWORK

The assessment work scope and sampling and quality analysis plan was developed in accordance with *The National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (2013 Amendment)*. This NEPM document has been adopted by the Tasmanian government as State Policy and can reasonably be referenced as the standard(s) of the EPA.

5. SITE DESCRIPTION/SETTING

5.1. Site Identification Information

Table 5.1 Site Identification Information

Site Address	1-5 Ryde Street, North Hobart, Tasmania 7000
Certificate of Title (CoT)	119922/1 Ref: www.thelist.tas.gov.au (30 August, 2018)
Property Identification Number (PID)	2003969 Ref: www.thelist.tas.gov.au (30 August, 2018)
Approximate Location of Area Under Assessment	The approximated location of the site centroid is: E: 525834 N: 5253822 (GDA 94 MGA55) Ref: www.thelist.tas.gov.au (30 August, 2018)

5.2. Land Use

Table 5.2.1 Site Land Use Information

Current Land Use	The property as a whole has a current 'recreational/public open space' land use however the specific investigation area would be classified as a commercial/industrial land use based on the definitions provided within Schedule B7 of the NEPM. The site contains a large grassed sports field surrounded by asphalt and concrete standing room viewing areas. There are multiple grandstands onsite. The investigation area sits within an area currently covered by asphalt and the current kiosk building.
Current Site Zoning	The site is zoned '18.0 Recreation' under the Hobart Interim Planning Scheme, 2015.
Surrounding Land Uses	• The property to the north, 393 Argyle street is operated as a hotel, with multi-level accommodation including ground floor apartments • To the west across Argyle street, to the south across Ryde Street and to the east across Letitia Street lie low density residential dwellings.
Site Area	The area of the site is approximately 35,070m² based on measurements provided within the Smeekes Drafting Plan NHO_K 001 (Appendix A)

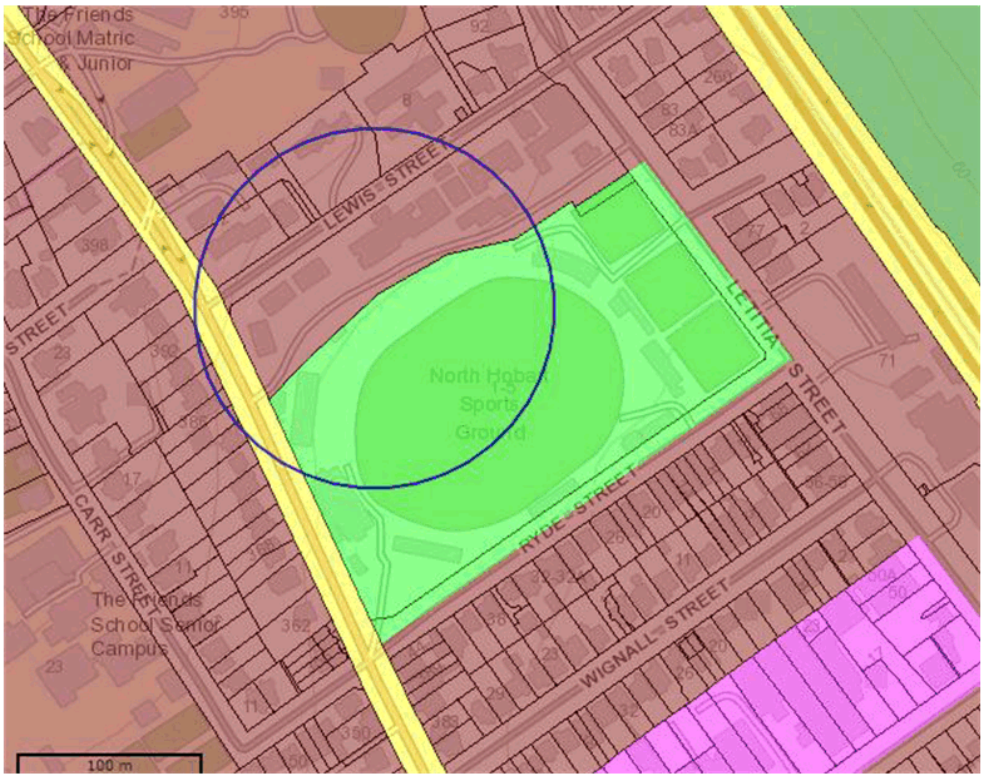

Figure 5.2. Local Area Land Zoning: The blue circle shows the area within a 100m radius of the approximate investigation area within the Site. Source: www.thelist.tas.gov.au. (August 2018). An explanation of the shading is provided within Table 5.2.2 below.

Table 5.2.2 Land Zoning Legend

Zoning Fill	Zoning ID	Zoning Description
	11.0	Inner Residential (Hobart Interim Planning Scheme 2015)
	18.0	Recreation (Hobart Interim Planning Scheme 2015)
	24.0	Light Industrial (Hobart Interim Planning Scheme 2015)
	28.0	Utilities (Hobart Interim Planning Scheme 2015)
	19.0	Open Space (Hobart Interim Planning Scheme 2015)

5.3. Topography & Hydrology

Mapped regional topography is shown below in Figure 5.3 and shows the general topography in the area falls to the south east towards the Hobart CBD. The elevation of the investigation area within the site is approximately 52mAHD, based on the survey contours provided within the Smeekes Drafting Plan NHO_K 003 (Appendix A). This value appears to be consistent with the topographic contours available from TheList (provided in Figure 5.3 below).

The nearest year-round surface water body down hydraulic gradient of the site is Hobart Rivulet, situated approximately 1.8km to the southwest of the site.

At this location, the rivulet would likely be classified as a marine ecosystem, as it is likely sitting within the tidal influence of the Derwent Estuary, located approximately 600m further downstream.

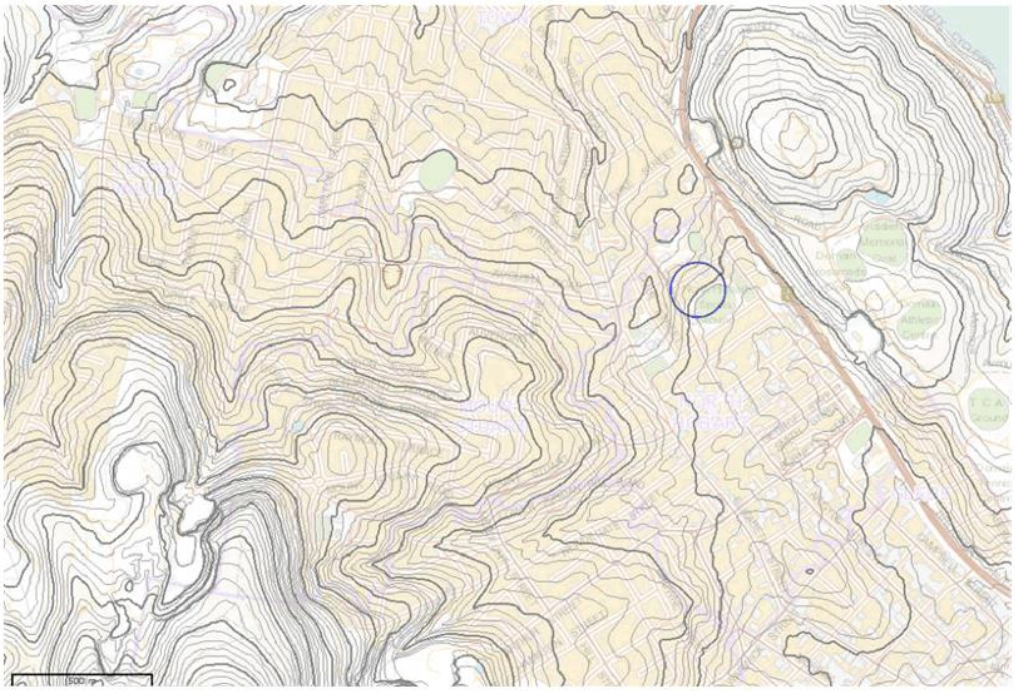

Figure 5.3. Local Area Topography: The blue circle shows the area within a 100m radius of the approximate investigation area within the Site. Source: www.thelist.tas.gov.au. (August 2018).

5.4. Geology

The site is situated in a shallow valley in between Jurassic aged dolerite outcrops to the northeast (The Glebe and Queens Domain) and the southwest (Knocklofty). The site is surrounded predominantly by Triassic aged sand and silt stones with mapped interbedded yellow brown or grey carbonaceous siltstone, mudstone and thin to thick-bedded quartz-rich lithic arkosic sandstone, below the investigation area.

Quaternary sediments lie to the southeast of the Site, following the low point of the valley further towards the southeast, following the path of where the Brooker Highway now lies towards the Wapping confluence with the Hobart Rivulet.

The following mapped geologies are present, and depicted within Figure 5.4 below (source: www.thelist.tas.gov.au accessed August 2018).

- **Q:** Undifferentiated Quaternary sediments.
- **Qa:** Alluvial gravel, sand and clay.
- **Qhmm:** Man made deposits
- **Tcbd:** Poorly sorted boulder to pebble grade deposits with boulders up to 3 m length, clasts generally dominantly of dolerite with traces to rarely dominant amounts of Upper Parmeener mudstone and other rocks and less commonly Lower Parmeener rocks.
- **Jd:** Dolerite and related rocks
- **R:** Undifferentiated Triassic fluviolacustrine sequences of sandstone, siltstone and mudstone.
- **Rv:** Undifferentiated volcaniclastic, quartz-rich lithic and quartzose sandstone, siltstone, mudstone, carbonaceous beds and coal seams.
- **Rqph:** Freshwater predominantly cross-bedded quartzose to feldspathic sandstone commonly with overturned cross-bedding, subordinate siltstone with sparse plant and vertebrate fossils (Knocklofty Formation).
- **Rvcg:** Thickly- to thinly-bedded volcanic lithic sandstone, siltstone, mudstone and coal seams, fossil plants on some horizons (Newtown Coal Measures).
- **Rvcq:** Interbedded cross-bedded white quartzose sandstone, quartz-rich lithic sandstone, siltstone and mudstone; Hobart area- upper interval with much dark grey carbonaceous mudstone, thin lenticular coal seams and fossil plants in places
- **Rvvf:** interbedded yellow brown or grey carbonaceous siltstone, mudstone and thin to thick-bedded quartz-rich lithic arkosic sandstone

Figure 5.4 Local Area Geology, Source: www.thelist.tas.gov.au (August 2018)

The site's shallow geology/soil horizons were encountered and logged as follows:

0.0 to 0.18mBGS	Asphalt
0.18 to 0.3mBGS	Fine Crushed Rock Fill, logged as medium sandy, very coarse SAND with medium gravel
0.3 to 0.6mBGS	Silty medium SAND with clay.
0.6 to 1.4mBGS	Very coarse sandy coarse SAND with fine gravel.

At a depth of 0.5-0.7mBGS within SB2, the soil profile appeared to be comprised of light friable charcoal fragments within a matrix of ash.

5.5. Hydrogeology

EM&C completed a search of Water Resources Tasmania's (WRT) Groundwater Information Access Portal (GIAP) in August 2018. This search identified no local groundwater bores within 500m of the site. A screenshot of the search is provided within Appendix F (Ref: wrt.tas.gov.au, 2018).

6. SAMPLING AND ANALYSIS QUALITY PLAN

This Sampling and Analysis Quality Plan (SAQP) aims to provide sufficient supporting data to determine the contamination and waste categorisation status of the site and excavated material, relative to the nominated assessment criteria. It also aims to present all data with an acceptable level of confidence. The project SAQP is summarised in the table below. The location PESA sample locations are shown on attached Figure 2, Sample Location Plan.

Table 6.0 Sampling and Analysis Quality Plan Summary

Objective of assessment	To assess the area identified for excavation/ground disturbance works for evidence of soil contamination, which may determine if the development will adversely impact on human health or the environment. Should such a finding be found, identify any specific remediation and/or protections measures required to be implemented before excavation commences. If offsite disposal of soil is required, classify the soil within the definitions provided within the Tasmanian EPA publication *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal*.
Quality Control samples to be collected	For soil media: • 1 duplicate per 20 samples provided to laboratory. • 1 equipment rinsate per 20 samples. • 1 laboratory prepared trip blank per day sampling. For Soil Vapour: • 1 duplicate per 20 samples provided to laboratory.
Media to be sampled	Soil and sub surface soil vapour.
Analytes to be tested for primary samples	**Soil:** Total hydrocarbons, reported as TRH and TPH fractions, benzene, toluene, ethylbenzene, xylenes, naphthalene (BTEXN), Tasmanian IB105 regulatory suite (metals, cyanide, PCBs, OC pesticides, phenols and PAHs). **Soil Vapour:** NEPM Suite: Total Recoverable Hydrocarbon (F1&F2 Fractions), BTEXN + Vinyl Chloride, PCE, TCE, TCA, cis-1,2- Dichloroethene.
Number of samples	**Soil:** Five soil bores (SB1 – SB5) to be completed with laboratory analysis of 11 discrete soil samples. Sample density chosen to allow for in-situ soil classification for disposal at a density of > 1/25m³) within shallow profile, along with sufficient samples of the soil which will be retained onsite, below the planned excavation extent of 51.49mAHD. Each soil bore to be screened for Volatile Organic Compounds ('VOC') as a minimum of every third of a meter. **Soil Vapour:** Soil vapour sampled using an installed soil vapour implant SV1_0.8-1.0
Sampling methods	**Soil:** Samples for analysis to be taken from a clean decontaminated hand auger (rinsate blanks to confirm decontamination process). Where other methods of sampling are employed to obtain a sample, the method of collection should be clearly noted along with the sample results. **Soil Vapour:** Sample for analysis to be collected in new, sterile tedlar bags.

Field Screening	**Soil:** Screening for VOCs at a minimum of each metre using a photo ionisation detector (PID). **Soil Vapour:** Screening for commonly encountered soil gases during the purging of soil vapour sample point prior to sample collection. Gases to be screened for include methane, carbon dioxide, oxygen, methane LEL, and VOCs.
Laboratory to be used	**NATA accredited laboratory:** ALS Environmental
Relevant Risk Assessment Criteria	Environmental Management and Pollution Control Act 1994 (EMPCA) The National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPM). The NEPM is state policy in Tasmania for the assessment of site contamination. *CRC Care (2011),* Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater. Technical Report No. 10, Part 2: Application Document. CRC Care (2013), Petroleum hydrocarbon vapour intrusion assessment: Australian guidance, Technical Report No.23, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia. Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, November 2012.

7. ASSESSMENT CRITERIA

The adopted environmental assessment criteria are detailed in Table 7.0 below.

Table 7.0 Adopted Site Assessment Soil and Soil Vapour (where relevant) Investigation Levels

	Criteria	Land Use Scenario	Relevant for Assessment	Application
ALL SOIL & SOIL VAPOUR	**Health Based Investigation Levels**			
	Health Investigation Levels	HIL A	No	Not applicable: No residential land use
		HIL B	No	
		HIL C	No	Site would broadly be construed as public open space, however the land use setting for a commercial/Industrial receptor is more appropriate due to the potential exposure scenario.
		HIL D	Yes	Assessment locations have been selected to lie below the planned Kiosk building. Occupiers of this space can broadly be defined as commercial/industrial receptors
	Health Screening Levels for Vapour Intrusion	HSL A & HSL B	No	Not applicable: as above
		HSL C	No	
		HSL D	Yes	Assessment locations have been selected to lie below the planned Kiosk building. Occupiers of this space can broadly be defined as commercial/industrial receptors
		IMW	Yes	It has been identified that intrusive maintenance works could foreseeably occur at the site within the investigation area. This screening level will also be appropriate for assessing the risk posed to construction workers during the proposed development excavation.
	Health Screening Levels for Direct Contact	HSL A	No	Not applicable: As above. No soil within the investigation area will remain unsealed following construction.
		HSL B	No	
		HSL C	No	
		HSL D	No	
		IMW	Yes	It has been identified that intrusive maintenance works could foreseeably occur at the site within the investigation area. This screening level will also be appropriate for assessing the risk posed to construction workers during the proposed development excavation.
	Ecology Based Investigation Levels			
	Ecological Investigation and Screening Levels	Areas of ecological significance	No	Not applicable. No identified ecological receptor within assessment area.
		Urban residential and public open space	No	
		Commercial and industrial	No	
	Management Limits and Aesthetic Investigation Levels			
	Soil Management Limits for Petroleum Hydrocarbons	Residential, parkland and public open space	No	Not applicable.
		Commercial and industrial	Yes	Considered due to on-going commercial use.
	Aesthetic Considerations	All	No	Not applicable.
SOIL ABOVE 51.5mAHD	**Tasmanian Waste Guidelines Classification and Management of Contaminated Soil for Disposal**			
	Controlled Waste Disposal Criteria	-	Yes	In-situ soil currently situated above 51.49mAHD has been identified for removal within Drawing NHO_K 003. To determine the suitability for offsite disposal and to categorise the waste, the soil should be assessed against the Controlled Waste Disposal Criteria.

8. ESA WORKSCOPE

The following work scope was completed to meet the assessment objective.

8.1.1. Soil Assessment

Mobilisation of two EM&C Environmental Consultants to site on 7 and 10 September 2018 to drill five soil bores, designated SB1 to SB5. All drilling locations are shown on attached Figure 2. The completed work scope comprised of:

- Logging of soil profile during and the field screening of soil samples collected from each completed soil bore at regular depth intervals and changes in soil type for the presence of VOCs using a photo ionisation detector (PID).
- The collection and laboratory analysis of eleven primary soil samples:
    - Screening and collection of samples at changes in soil type, areas of visible staining and diverse relative depths.
    - Of the eleven soil samples collected, six primary samples were taken from soil located above 51.49mAHD (which is proposed to be excavated), with the remaining five primary samples taken below this depth, intending to be reflective of in-situ conditions following the proposed development.
    - In order to identify hot spots, samples destined for analysis were selected based on where the level of contamination was expected to be the most significant.
    - The collection and laboratory analysis of the following field QA/QC sample:
        - One blind duplicate sample designated QCP_7/9/18, a duplicate of SB1_0.2-0.3.
    - Collection of samples into sterile glass jars and placement of these jars into a chilled and insulated esky.
    - Transportation of samples to a NATA-accredited laboratory for analysis of the schedule listed within the Sampling and Analysis Quality Plan (Section 6 above).
- The collection and analysis of additional QA/QA samples, an equipment rinsate blank and a trip blank soil sample.

8.1.2. Sub Slab Soil Vapour Assessment

During the soil assessment stage conducted on 10 September 2018, one soil vapour sample point was installed to a depth of 0.8-1.0 meter below current ground surface. The sample point will reflect soil vapour conditions at 51.2-51.4mAHD, which will be located 0.09-0.29m below the proposed finished ground level. Sample locations are provided on attached Figure 2. The completed installation and sampling program comprised:

- Installation of one soil vapour sample point
- The purging and field monitoring of the composition of the soil gas profile including the recording of the concentration of the following compounds:
  - Methane;
  - Oxygen;
  - Carbon dioxide;
  - LEL% (methane); and
  - Volatile organic compounds.
- The collection and laboratory analysis of soil vapour from the previously installed sample point (SV1_0.8-1.0).
  - Collection of soil vapour sample using a graduated syringe and storage of sample within a new/sterile tedlar bag.
  - The collection and laboratory analysis of the following field QA/QC sample:
    - One blind duplicate sample designated QCP_11/9/18.
      - Upon receipt of the sample QCP_11/9/18, the laboratory reported to EM&C that the tedlar bag had leaked during transit, making analysis not possible.
  - Transportation of samples to a NATA-accredited laboratory for analysis of the schedule listed within the Sampling and Analysis Quality Plan (Section 6 above).

9. RESULTS

The following section presents field observations, measurements and laboratory results. Laboratory results have been presented relative to:

- NEPM Tier 1 assessment criteria for identified potential receptors at the site.
- *Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, November 2012* criteria for potential offsite disposal categorisation.

'Sand' has been selected conservatively as the soil texture group[6] most representative of the site's confining geology. Assessment drill logs are included within Appendix E.

Due to the proposed development involving the excavation of soil, EM&C have adjusted the sample depth for assessment purposes to reflect the post development sample depth when assessing against screening criteria.

9.1. Soil Field Observations

No detectable concentrations of VOCs were detected through the screening of collected soil samples using a PID.

9.2. Soil Analytical Results v Commercial Land Use Criteria

Summarised soil sample results assessing Contaminants of Potential Concern (COPC) are presented below and in attached Table 1. Laboratory certificates of analysis are included within Appendix C.

- No exceedance of the NEPM Health Investigation Levels for a 'commercial/industrial' land use (HIL D).
- No exceedance of the NEPM Health Screening Levels (HSLs) for a 'commercial/industrial' land use (HSL D).
- No exceedance of CRC CARE intrusive maintenance worker (IMW) HSLs for either direct contact or vapour intrusion were found.
- No exceedance of the NEPM Soil Management Limits for 'commercial and industrial' land use.

[6] Reference to soil texture groups as defined by United States Department of Agriculture (USDA)

9.3. Soil Analytical Results v TAS Soil Disposal Guidelines (IB105)

Summarised soil sample results of samples situated above the extent of the proposed excavation cutting, assessing COPCs against the Tasmanian Soil Disposal Guidelines[7] is provided within attached Table 2. A laboratory prepared comparative analytical report of the same samples is included within Appendix C.

- The following samples exceeded the maximum allowable total concentration for Low Level Contaminated Soil/Level 2 for benzo(a)pyrene (2.0mg/kg)
    - SB1_0.2-0.3 (3.0mg/kg)
    - SB2_0.2-0.3 (2.2mg/kg)
    - SB5_0.3-0.4 (2.7mg/kg)

Based on the above exceedances of Level 2 criteria, under the Tasmanian Soil Disposal Guidelines[8] the soil identified for excavation and disposal can be classified as Contaminated Soil/Level 3.

9.4. Soil Vapour Results

Summarised soil vapour sample results assessing Contaminants of Potential Concern (COPC) are presented below and in attached Table 3. Laboratory certificates of analysis are included within Appendix C.

- No exceedance of the NEPM Health Screening Levels (HSLs) for a 'commercial/industrial' land use (HSL D) were identified.
- No exceedance of CRC CARE intrusive maintenance worker (IMW) HSLs vapour intrusion were found.

9.5. QA/QC Results

Field QA/QC analytical results are presented in attached Tables 4a and 4b. Copies of the NATA endorsed laboratory reports, including internal QA/QC results and chain-of-custody documentation for the primary laboratory are included within Appendix C.

The findings of the projects precision, accuracy, representativeness, comparability and completeness data quality indicators (DQIs) are summarised within this section. In addition a DQI checklist has been attached in Appendix D. Additionally, CRC CARE Checklists L and K are included within Appendix G.

9.5.1. Comparability

- An appropriately experienced person - in accordance with EM&C's Assessment Procedure detailed within the SAQP outlined in Section 6, collected all samples.
- The laboratory used was NATA-accredited for the requested analytes and provided documented methods of analysis.

---

[7] Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (v3 2018)

[8] Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (v3 2018)

9.5.2. Precision

Assessment of quality control data revealed:

- Soil field duplicates reported COPC concentrations within the assessment relative percentage difference (RPD) criteria[9] for all duplicate samples taken.
- The soil vapour field duplicate of SV1_0.8-1.0 leaked during transit to the laboratory, and therefore was not analysed.
- Non-conformity was observed within the following laboratory standards, calibration blanks and verifications. Internal Quality Control (QCI) reports are supplied within Appendix C

9.5.3. Accuracy

All field equipment was calibrated prior to use. See calibration certificates provided within Appendix E.

9.5.4. Representativeness

- All media identified in the project's SAQP in Section 6 have been sampled.
- All samples were put into containers provided by a NATA-accredited laboratory, stored in a chilled esky (soil) and transported to each laboratory within holding times. See Appendix C for laboratory sample receipt notices.
- Target analytes were not detected in trip blank or equipment rinsate blank samples.
- No inconsistencies were identified within the method of sample collection.
- No inconsistencies have been identified in laboratory methods.

9.5.5. Completeness

- All samples locations have been sampled in accordance with the SAQP.
- All samples were sent to each laboratory within technical holding times and with accurately completed documentation.
- EM&C considers the collected dataset sufficiently complete to be relied upon to support the assessments data quality objectives.

[9] Which is calculated based on the primary result, relative to the primary laboratory LOR

10. CONCLUSIONS

At the completion of the Preliminary Environmental Site Assessment (PESA), undertaken to make an assessment of the proposed development, and subject to the assessment scope and statement of limitations (Section 11), EM&C conclude that:

- The assessed level of site contamination does **not** pose an unacceptable level of risk to workers involved in redevelopment of the site, or to future users of the site, as a result of proposed excavation.
- The assessed level of site contamination does **not** pose an unacceptable level of risk to the environment from the proposed excavation, due to an absence of ecological receptors within the assessment area.
- Assessment of the material identified for excavation above 51.49mAHD has found:
    - The material is suitable for onsite reuse within the area proposed for 'fill' within drawing number NHO_K 003, which is to be a covered terrace area, and contained within a blockwork retaining wall (Appendix A). This area is also identified within attached Figure 2 as a purple shaded area.
        - This conclusion is made on the basis that ecological screening levels are not applicable, due to the absence of ecological receptors within this area.
    - The material is unsuitable for reuse anywhere onsite where ecological screening levels apply, which are unsealed areas at a depth of less than 2 meters below ground surface, which is representative of root and habitation zones of many flora and fauna species. Examples of such areas unsuitable for reuse of excavated material includes (but is not limited to):
        - Grassed areas;
        - Garden beds; and
        - Other unsealed areas
    - The concentration of benzo(a)pyrene within the soil would presently see this material classified as Contaminated Soil/Level 3 under the Tasmanian waste classification guidelines IB105 if removed from the site.
    - Should the excavated material be removed from site, the soil is to be handled in accordance with Tasmanian Soil Disposal Guidelines[10].

EM&C recommend the following remediation/protection measures are implemented before excavation commences:

- A construction and environmental management plan should be prepared to ensure the excavated soil and associated contaminants do not spread to areas where ecological screening levels are applicable.

[10] Information Bulletin 105: Classification and Management of Contaminated Soil for Disposal (v3 2018)

With reference to the Potentially Contaminated Land Code of the Hobart Interim Planning Scheme 2015, clause E2.6.2 Excavation (b), the completed preliminary environmental site assessment has established, based on the plans provided:

- The planned 'excavation **does not adversely impact on human health or the environment**'; and
- '**specific remediation and protection measures**' are required to be implemented before excavation commences'

The report conclusions are made against both the existing and proposed future land use, as identified within the drafting plans (Appendix A). Further assessment may be required if a change to a more sensitive land use is proposed or the environmental condition of other areas of the site need to be assessed.

11. STATEMENT OF LIMITATIONS

This report has been prepared in accordance with the scope of services described in the contract or agreement between Environmental Management & Consulting Pty Ltd (EM&C) and the Client. The report relies upon data, surveys, measurements and results taken at or under the particular times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the Client. Furthermore, the report has been prepared solely for use by the Client and EM&C accepts no responsibility for its use by other parties. The client agrees that EM&C's report or associated correspondence will not be used or reproduced in full or in part for promotional purposes and cannot be used or relied upon in any prospectus or offering.

No warranties express or implied are made. Subject to the Scope of Work, EM&Cs assessment is limited strictly to identifying typical environmental conditions associated with the subject property and does not include evaluation of the structural conditions of any buildings on the subject property or any other issues. Additionally unless otherwise stated EM&C did not conduct soil, air, wastewater or other matrix analyses including asbestos or perform contaminated sampling of any kind. Nor did EM&C investigate any waste material from the property that may have been disposed of off the site, nor related waste management practices.

The results of this assessment are based upon site inspection conducted by EM&C personnel, information from interviews with people who have knowledge of site conditions and information provided by regulatory agencies. All conclusions and recommendations regarding the property are the professional opinions of the EM&C personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability have been made, EM&C assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of EM&C, or developments resulting from situations outside the scope of this project.

EM&C is not engaged in environmental auditing and /or reporting of any kind for the purpose of advertising sales promoting, or endorsement of any clients' interests, including raising investment capital, recommending investment decisions, or other publicity purposes. EM&C assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of EM&C, or developments resulting from situations outside the scope of this project.

Information relating to soil, groundwater, waste, air or other matrix conditions in this document is considered to be accurate at the date of issue. Surface, subsurface and atmospheric conditions can vary across a particular site or region, which cannot be wholly defined by investigation. As a result, it is unlikely that the results and estimations presented in this report will represent the extremes of conditions within the site that may exist. Subsurface conditions including contaminant concentrations can change in a limited period of time and typically have a high level of spatial heterogeneity.

From a technical perspective, there is a high degree of uncertainty associated with the assessment of subsurface, aquatic and atmospheric environments. They are prone to be heterogeneous, complex environments, in which small subsurface features or changes in geologic conditions or other environmental anomalies can have substantial impact on water, air and chemical movement.

Major uncertainties can also occur with source characterization assessment of chemical fate and transport in the environment, assessment of exposure risks and health effects, and remedial action performance. These factors make uncertainty an inherent feature of potentially impacted sites. Technical uncertainties are characteristically several orders of magnitude greater at impacted sites than for other kinds of projects.

EM&C's professional opinions are based upon its professional judgment, experience, and training. These opinions are also based upon data derived from the limited testing and analysis described in this report. It is possible that additional testing and analysis might produce different results and/or different opinions or other opinions. EM&C has limited its investigation(s) to the scope agreed upon with its client. EM&C believes that its opinions are reasonably supported by the testing and analysis that has been undertaken (if any), and that those opinions have been developed according to the professional standard of care for the environmental consulting profession in this area at this time. Other opinions and interpretations may be possible. That standard of care may change and new methods and practices of exploration, testing and analysis may develop in the future, which might produce different results.

EM&C is not in the business of providing legal advice.

12. REFERENCES

Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand (2000) [Referenced as ANZECC 2000], Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1.

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NHMRC (2011), Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra.

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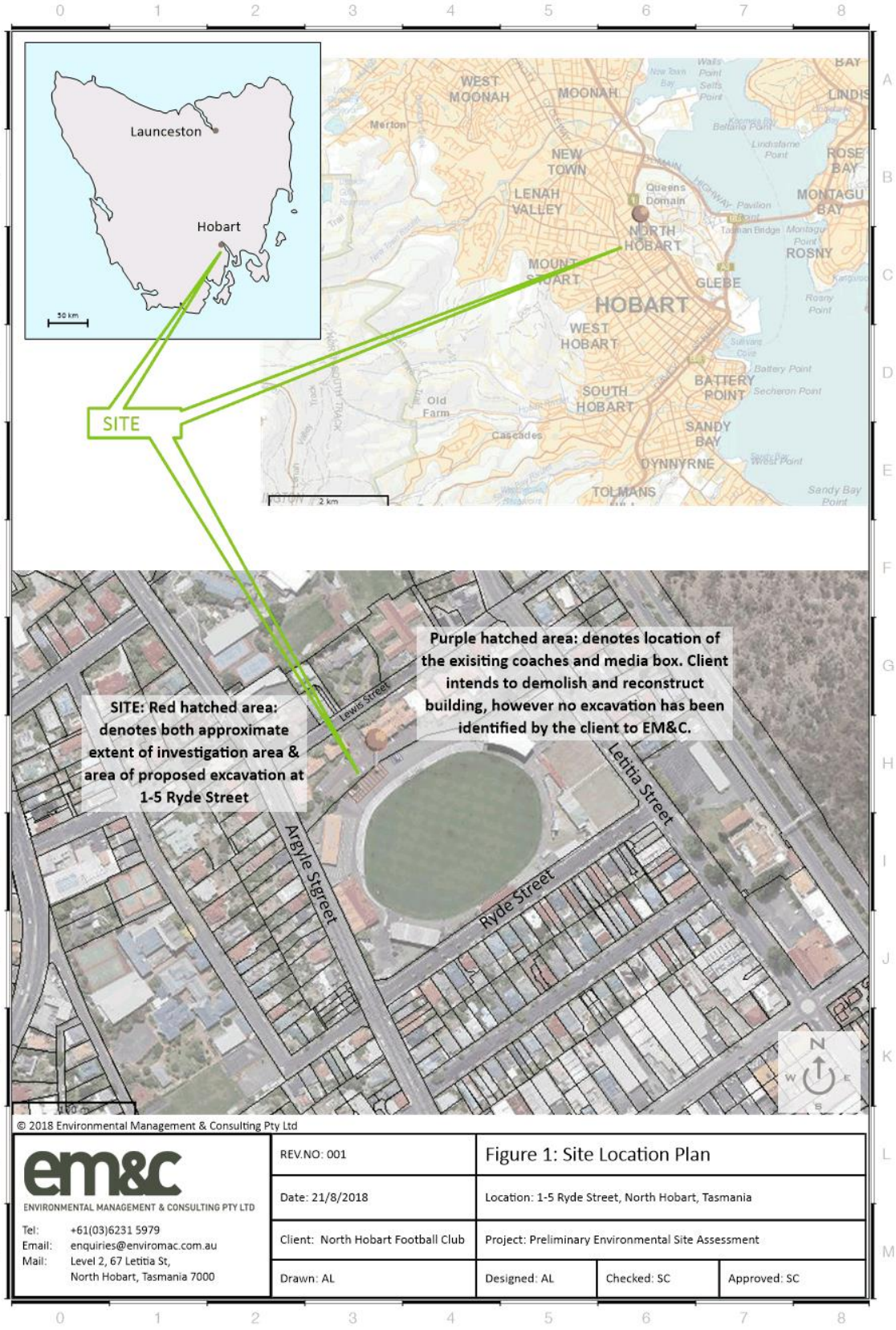
The LIST, 2018, www.thelist.tas.gov.au, Land Information System Tasmania, accessed by EM&C in September 2018

FIGURES



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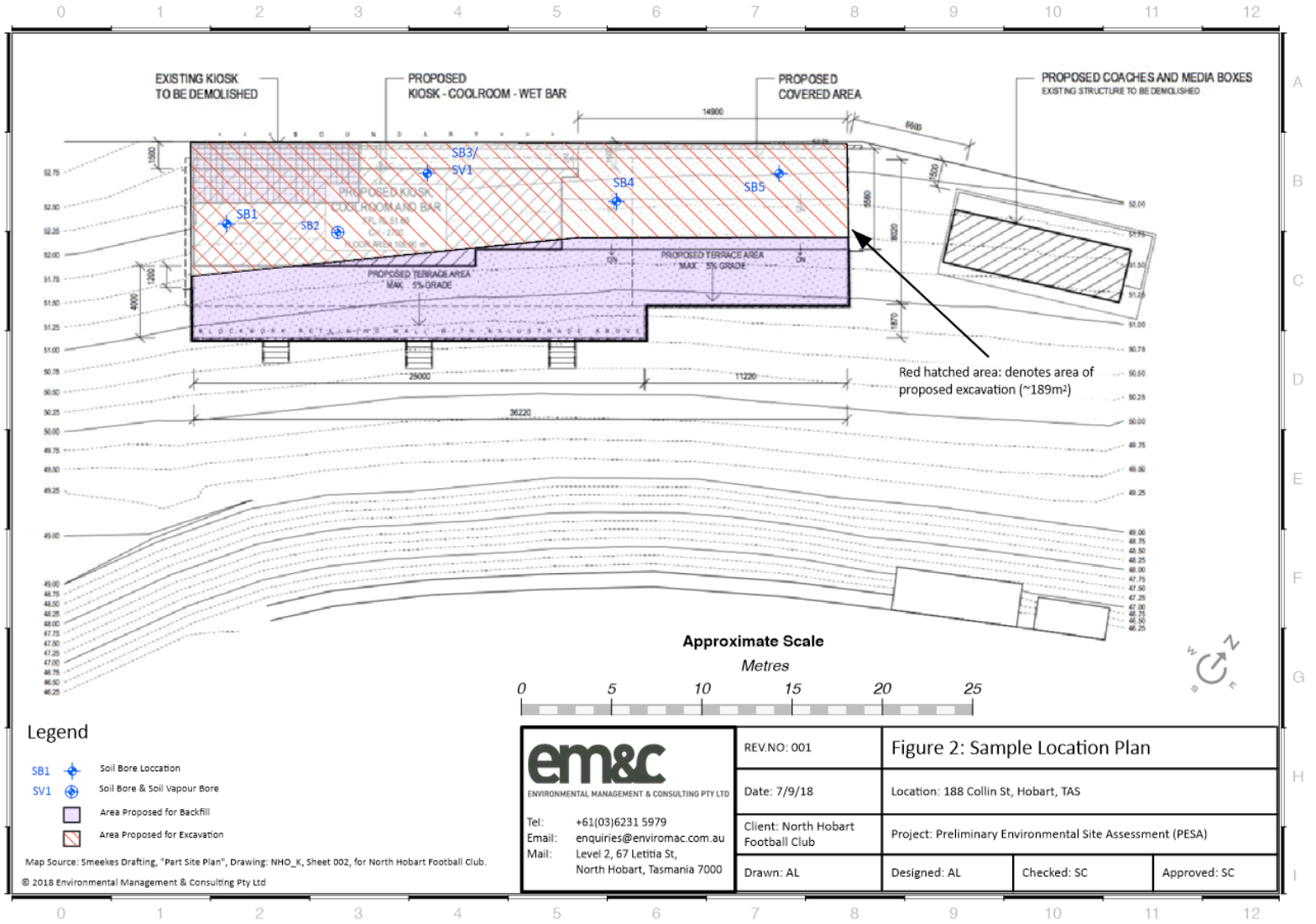
ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD
Tel: +61(03)6231 5979
Email: enquiries@enviromac.com.au
Mail: Level 2, 67 Letitia St,
North Hobart, Tasmania 7000

REV.NO: 001	Figure 1: Site Location Plan		
Date: 21/8/2018	Location: 1-5 Ryde Street, North Hobart, Tasmania		
Client: North Hobart Football Club	Project: Preliminary Environmental Site Assessment		
Drawn: AL	Designed: AL	Checked: SC	Approved: SC


EXISTING KIOSK TO BE DEMOLISHED
PROPOSED KIOSK - COOLROOM - WET BAR
PROPOSED COVERED AREA
PROPOSED COACHES AND MEDIA BOXES
EXISTING STRUCTURE TO BE DEMOLISHED
SB1
SB2
SB3/ SV1
SB4
SB5
PROPOSED TERRACE AREA MAX. 5% GRADE
Red hatched area: denotes area of proposed excavation (~189m²)
Approximate Scale
Metres
0 5 10 15 20 25
Legend
SB1 Soil Bore Loccation
SV1 Soil Bore & Soil Vapour Bore
Area Proposed for Backfill
Area Proposed for Excavation
Map Source: Smeekes Drafting, "Part Site Plan", Drawing: NHO_K, Sheet 002, for North Hobart Football Club.
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ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD
Tel: +61(03)6231 5979
Email: enquiries@enviromac.com.au
Mail: Level 2, 67 Letitia St, North Hobart, Tasmania 7000
REV.NO: 001
Figure 2: Sample Location Plan
Date: 7/9/18
Location: 188 Collin St, Hobart, TAS
Client: North Hobart Football Club
Project: Preliminary Environmental Site Assessment (PESA)
Drawn: AL
Designed: AL
Checked: SC
Approved: SC

TABLES

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Table 1

In-Situ Soil Validation Analytical Results v Land Use Criteria

Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene, Polycyclic Aromatic Hydrocarbons and Lead

Sample ID_Depth *(m)*	Sample Date	Sample Location Ground Surface RL[6]	Post Development sample depth (mBGS)	PID Results *(ppm)*	Soil Moisture Content	Land Use	Confining Geology (USDA Soil Texture Group)[7]	Total Recoverable Hydrocarbons *(mg/kg)*						Benzene *(mg/kg)*	Toluene *(mg/kg)*	Ethyl-benzene *(mg/kg)*	Xylenes *(mg/kg)*	Naph-thalene[4] *(mg/kg)*	Polycyclic Aromatic Hydrocarbons *(mg/kg)*			Carcino-genic PAHs as BaP TEQ[5] *(mg/kg)*	Lead *(mg/kg)*
								C6 - C10	F1 *C6 - C10 less BTEX*	>C10 - C16	F2 *>C10 - C16 less Naphthalene*	F3 *>C16 - C34*	F4 *>C34 - C40*						Naph-thalene[4]	Benzo(a)-pyrene	Total PAHs		
In-Situ Excavation Soil Assessment 4 September 2018																							
SB1_0.2-0.3	07-Sep-18	52.10	NA - Excavated	0.0	12.5	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	280	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	3.0	27.9	3.8	90
SB1_0.5-0.6	07-Sep-18	52.10	NA - Excavated	0.0	16.2	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.1	<0.5	0.6	35
SB1_1.0-1.1	07-Sep-18	52.10	0.40	0.0	13.8	Com. / Ind.	SAND: 0- < 1m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB2_0.2-0.3	07-Sep-18	51.80	NA - Excavated	0.0	13.8	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.2	10.5	1.9	28
SB2_0.5-0.6	07-Sep-18	51.80	0.20	0.0	14.2	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	3.2	0.6	28
SB3_0.4-0.5	10-Sep-18	52.20	NA - Excavated	0.0	8.7	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.6	1.4	0.6	26
SB3_0.9-1.0	10-Sep-18	52.20	0.20	0.0	13.3	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	120	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	29.4	3.0	158
SB4_0.2-0.3	07-Sep-18	51.80	NA - Excavated	0.0	5.8	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.05	<0.5	0.6	<5
SB4_1.3-1.4	07-Sep-18	51.80	1.00	0.0	15.7	Com. / Ind.	SAND: 1- < 2 m	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	1.8	0.6	42
SB5_0.3-0.4	07-Sep-18	52.00	NA - Excavated	0.0	10.8	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	140	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.7	24.9	4.0	49
SB5_0.5-0.6	07-Sep-18	52.00	0.00	0.0	12.9	Com. / Ind.	SAND: 0- < 1m	<10	<10	<50	<50	100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	-	4.4	1.1	76
Limit of Reporting Soil								10	10	50	50	100	100	0.2	0.5	0.5	0.5	1.0	0.5	0.5	0.5	-	5
NOMINATED GENERIC INVESTIGATION CRITERIA																							
[1] **NEPM HIL 'D' - Commercial/ Industrial**								-	-	-	-	-	-	-	-	-	-	-	-	-	4000	40	1500
[1] **NEPM Soil HSL 'D' for Vapour Intrusion - Commercial/ Industrial**							SAND: 0- < 1m	-	260	-	NL	-	-	3	NL	NL	230	NL	-	-	-	-	-
[1] **NEPM Soil HSL 'D' for Vapour Intrusion - Commercial/ Industrial**							SAND: 1- < 2 m	-	370	-	NL	-	-	3	NL	NL	NL	NL	-	-	-	-	-
[2] **CRC CARE Soil HSL 'D' for Direct Contact - Commercial/ Industrial**							-	-	26000	-	20000	27000	38000	430	99000	27000	81000	11000	-	-	-	-	-
[2] **CRC CARE Soil HSL 'IMW' for Vapour Intrusion - Intrusive Maintenance Worker**							SAND: 0- < 2 m	-	NL	-	NL	NL	NL	77	NL	NL	NL	NL	-	-	-	-	-
[2] **CRC CARE Soil HSL 'IMW' for Direct contact - Intrusive Maintenance Worker**							-	-	82000	-		85000	120000	1100	120000	85000	130000	29000	-	-	-	-	-
[1] **NEPM Soil Management Limits - Commercial and industrial**							COARSE SOIL	700	-	1000	-	3500	10000	-	-	-	-	-	-	-	-	-	-
[1] **Soil Saturation concentration**							SAND	-	950	-	560	-	-	360	560	64	300	9	9	-	-	-	-

Tables Notes:

1) Assessment criteria are obtained from National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 1999)

2) Assessment criteria are obtained from CRC CARE Technical Report no. 10: Health screening levels for petroleum hydrocarbons in soil and groundwater (Friebel & Nadebaum 2011)

3) ESL criteria have been established for protection of plant root zones and are applicable in non-arid areas for assessment of soil witin the 0- 2mBGS depth range.

4) Laboratory analysis of naphthalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

5) HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P adopted by CCME 2008 (refer Schedule B7). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF and summing these products. TEQs have been calculated using half of the LOR result, where <LOR was reported.

6) Sample point RLs have been estimated based on the ground surface contour plan provided within Drawing NHO_K 003

7) sample depth is based on post development sample depth. For all sames within the zone planned for excavation, EM&C hs conservatively assumed a screening depth of 0-1m with a SAND confining geology

"-" denotes analyte not tested by laboratory, or no criteria available.

Bold values are concentrations reported above laboratory limit of reporting

Highlighted values exceed nominated investigation criteria.

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

HSL: Health Screening Level

HIL: Health Investigation Level

ESL: Environmental Screening Level

EIL: Environmental Investigation Level

IMW: Intrusive Maintenance Worker

PID: Photo-Ionisation Detection

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Table 2
Soil Results
Total Petroleum Hydrocarbons, Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene, Polycyclic Aromatic Hydrocarbons and Lead

Sample ID_Depth *(m)*	Sample Date	PID Results *(ppm)*	Soil Moisture Content	Total Petroleum Hydrocarbons *(mg/kg)*					Benzene *(mg/kg)*	Toluene *(mg/kg)*	Ethyl- benzene *(mg/kg)*	Xylenes *(mg/kg)*	Naph-thalene[2] *(mg/kg)*	Polycyclic Aromatic Hydrocarbons *(mg/kg)*			Lead *(mg/kg)*
				C6 - C9	C10 - C14	C15 - C28	C29 - C36	Total C10 - C36						Naph-thalene[2]	Benzo(a)-pyrene	Total PAHs	
In-Situ Soil Assessment of Soil Situated Above 51.5mAHD - 7 September 2018																	
SB1_0.2-0.3	07-Sep-18	0.0	12.5	<10	<50	**210**	<100	**210**	<0.2	<0.5	<0.5	<0.5	<1	<0.5	3.0	27.9	**90**
SB1_0.5-0.6	07-Sep-18	0.0	16.2	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.1	<0.5	**35**
SB2_0.2-0.3	07-Sep-18	0.0	13.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.2	10.5	**28**
SB3_0.4-0.5	10-Sep-18	0.0	8.7	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	0.6	1.4	**26**
SB4_0.2-0.3	07-Sep-18	0.0	5.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.05	<0.5	<5
SB5_0.3-0.4	07-Sep-18	0.0	10.8	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<1	<0.5	2.7	24.9	**49**
Limit of Reporting Soil				10	50	100	100	50	0.2	0.5	0.5	0.5	1.0	0.5	0.5	0.5	5
Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, 2018																	
Fill Material - Level 1				65	-	-	-	1,000	1	1	3	14	-	-	0.08	20	300
Low Level Contaminated Soil - Level 2				650	-	-	-	5,000	5	100	100	180	-	-	2	40	1,200
Contaminated Soil - Level 3				1,000	-	-	-	10,000	50	1,000	1,080	1,800	-	-	20	200	3,000

Tables Notes:

1) Assessment criteria are obtained Tasmanian EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal, 2018

2) Laboratory analysis of naphtalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

"-" denotes analyte not tested by laboratory, or no criteria available.

Bold values are concentrations reported above laboratory limit of reporting

Highlighted values exceed nominated investigation criteria.

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

HSL: Health Screening Level

IMW: Intrusive Maintenance Worker

PID: Photo-Ionisation Detection

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Table 3
Soil Vapour Results
NEPM Suite: Total Recoverable Hydrocarbon (F1&F2 Fractions), BTEXN + Vinyl Chloride, PCE, TCE, TCA, cis-1,2- Dichloroethene

Sample ID_Sample Depth (m)	Sample Date	Installed Sample Depth Range	Sample Location Ground Surface RL[3]	Post Development sample depth (mBGS)	Land Use	Confining Geology	TRH (µg/m³)		Benzene (µg/m3)	Toluene (µg/m3)	Ethylbenzene (µg/m3)	Xylenes (µg/m3)	Naph-thalene (µg/m3)	TCE (µg/m3)	1,1,1-TCA (µg/m3)	PCE (µg/m3)	cis-1,2-dichloro-ethene (µg/m3)	Viynl Chloride (µg/m3)	Light HCs and Permanent Gasses Mol (%)			
							F1 C_6 - C_{10} less BTEX	F2 >C_{10}-C_{16} less Naph-thalene											Oxygen	CO_2	Helium	Methane
Soil Vapour Sampling Event - 11/9/18																						
SV1_0.8-1.0	11-Sep-18	0.8-1.0m	52.20	0.1-0.3	Com. / Ind.	SAND: 0 - 1m	<20000	<40000	<100	<190	<220	<650	<100	<5.4	<270	<340	<20	<5.1	**17.7**	**2.81**	<0.01	<0.1
NOMINATED GENERIC INVESTIGATION CRITERIA																						
[1] NEPM Soil Vapour HSL 'D' for Vapour Intrusion						SAND: 0- < 1 m	680000	500 000	4 000	4 800 000	1 300 000	840 000	3 000	80	230000	8000	300	100	-	-	-	-
[2] CRC CARE HSL, Vapour Intrusion, Intrusive Maintenace Worker						SAND: 0- < 2 m	180 000 000	-	760 000	-	-	-	880 000	-	-	-	-	-	-	-	-	-

Table Notes

1) Assessment criteria are obtained from National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 1999)

2) Assessment criteria for an Intrusive Maintenace Worker (IMW) are obtained from CRC CARE Technical Report no. 10: Health screening levels for petroleum hydrocarbons in soil and groundwater (Friebel & Nadebaum 2011)

3) Sample point RLs have been estimated based on the ground surface contour plan provided within Drawing NHO_K 003

"-" denotes analyte not tested by laboratory, or no criteria available. Highlighted values exceed nominated investiga **Bold** values are concentrations reported above laboratory limit of reporting

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

IMW: Intrusive Maintenance Worker

HSL: Health Screening Level

mBGS - metre below ground surface

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Table 4a
Soil Assessment QA/QC Results
Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylenes

Sample ID /Depth *(m)*	Sample Date			Total Recoverable Hydrocarbons *(mg/kg)*				Benzene *(mg/kg)*	Toluene *(mg/kg)*	Ethylbenzene *(mg/kg)*	Xylenes *(mg/kg)*	Naphthalene[1] *(mg/kg)*
				F1 *C6 - C10 less BTEX*	F2 *>C10 - C16 less Naphthalene*	F3 *>C16 - C34*	F4 *>C34 - C40*					
Duplicate Samples **(all soil results in mg/kg)**												
In-Situ Excavation Validation Soil Assessment												
SB1_0.2-0.3	07-Sep-18			<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
QCP_7/9/18	Primary laboratory	Duplicate of	SB1_0.2-0.3	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
Relative % Difference	SB1_0.2-0.3	and	QCP_7/9/18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RPD criteria				NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT
Pass/Fail				Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Limit of Reporting (LOR) - Soil Samples **(mg/kg)**												
Limit of Reporting ALS (Primary)				10	50	100	100	0.2	0.5	0.5	0.5	1.0
Soil Assessment Trip Blank Samples **(mg/kg)**												
TB_4/9/18	04-Sep-18	Trip Blank		<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1
Soil Assessment Equipment Rinsate Blank Samples **(µg/l)**												
RB_4/9/18	04-Sep-18	Rinsate Blank		<20	<100	<100	<100	<1	<2	<2	<2	<5

Tables Notes:

1) Laboratory analysis of naphtalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

"-" denotes analyte not tested by laboratory, or no criteria available.

Bold values are concentrations reported above laboratory limit of reporting.

Highlighted values exceed nominated investigation criteria.

QC- Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable, and have been adopted for this assessment:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Table Abbreviations

NEPM: National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013

CRC CARE: Cooperative Research Centre for Contamnination Assessment and Remediation of the Environment

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Table 4b

Soil Vapour Assessment QA/QC Results

Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylenes

Sample ID /Depth *(m)*	Sample Date	Total Recoverable Hydrocarbons *(µg/m3)*		Benzene *(mg/m³)*	Toluene (µg/m³)	Ethylbenzene *(µg/m³)*	Xylenes *(µg/m³)*	Naphthalene[6] *(µg/m³)*	Helium (µg/m³)	Field Measured Helium (µg/m³)
		F1 *C6 - C10 less BTEX*	**F2** *>C10 - C16 less Naphthalene*							
Duplicate (Primary Lab)										
SV1_0.8-1.0	11-Sep-18	<20000	<40000	<100	<190	<220	<650	<100	**<16,000**	
QCP_11/9/18	11-Sep-18 Duplicate of SV1_0.8-1.0	**Sample lost in transit to laboratory (sample bag deflated)**								
Relative % Difference	SV1_0.8-1.0 and QCP_11/9/18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A
RPD criteria		NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	NO LIMIT	-	NO LIMIT
Pass/Fail		-	-	-	-	-	-	-	-	-
Sample Train Integrity Analysis										
SV1_0.8-1.0	11-Sep-18	-	-	-	-	-	-	-	16000	-
[1] SV1_0.8-1.0 - He Shroud	11-Sep-18	-	-	-	-	-	-	-	*1473128834*	9000000
[2]Sample concentration relative to shroud		-	-	-	-	-	-	-	0.001%	-
[3]CRC CARE TR23 Guidance		-	-	-	-	-	-	-	10%	-
[4]California Environmental Protection Agency - Performance Criteria		-	-	-	-	-	-	-	5%	-
Pass/Fail		-	-	-	-	-	-	-	Pass	-
Limit of Reporting (LOR) - Soil Vapour Samples										
Limit of Reporting ALS		20000	40000	100	190	220	650.0	100.0	16000	-

Tables Notes:

"-" denotes analyte not tested by laboratory, or no criteria available.

1) Helium shroud concentrations are measured via a calibrated handheld helium meter, reporting results in parts per million by volume. The µg/m3 equivilent concentration has been calculated for comparison against the reported concentration of helium within collected soil vapour samples. The formula used for calculation is: µg/m3 = ppmv x atomic mass ÷ 24.45 x 1000

2) Relative concentration is the concentration of helium found within the sample/sample train relative to the concentration found within the shroud during sample collection. Where the analysed concentration of helium was below the LOR, the LOR was used for comparison calculations.

3) CRC CARE provides guidance on the concentration of helium allowable during field leak testing (10% of the shroud concentration) however the document does not provide guidance on the acceptable levels within the collected sample.

4) California EPA Department of Toxic Substances Control provided guidance in July 2015 (https://www.dtsc.ca.gov/SiteCleanup/upload/VI_ActiveSoilGasAdvisory_FINAL.pdf) advising a concentration of up to 5% of the helium concentration used within the shroud is acceptable within the collected sample.

5) QA/QC provided above consist of all QAQC samples taken since prior reporting period

6) Laboratory analysis of naphtalene is conducted using two separate methods, EP080: extracting sample for volatiles and EP075(SIM)B: extracting sample for semi-volatiles. The naphthalene concentration from EP080 is used for F2 calculation.

"-" denotes analyte not tested by laboratory, or not relevant to QA/QC performance criteria being tested.

Bold values are concentrations reported above laboratory limit of reporting

Italicised values have been calculated based on field reported readings, taken from calibrated field instruments.

Bold values are concentrations reported above laboratory limit of reporting

QC- Acceptance Criteria

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Table 4b

Soil Vapour Assessment QA/QC Results

Total Recoverable Hydrocarbons, Benzene, Toluene, Ethylbenzene and Xylenes

Sample ID /Depth *(m)*	Sample Date	Total Recoverable Hydrocarbons *(µg/m3)*		Benzene *(mg/m^3)*	Toluene (µg/m^3)	Ethylbenzene *(µg/m^3)*	Xylenes *(µg/m^3)*	Naphthalene[6] *(µg/m^3)*	Helium (µg/m^3)	Field Measured Helium (µg/m^3)
		F1 *C6 - C10 less BTEX*	**F2** *>C10 - C16 less Naphthalene*							

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable, and have been adopted for this assessment:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Table Abbreviations

APPENDIX A

Smeekes Drafting Plans

GENERAL NOTES:

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SMEEKES DRAFTING PTY LTD STANDARD BUILDING NOTES, SHEETS STANDARD-001 TO 008.
2. WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALE.
3. BUILDER TO VERIFY ALL BOUNDARY CLEARANCES AND SITE SET-OUT DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. ALL CONSTRUCTION WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AND RELEVANT AUSTRALIAN STANDARDS.
5. TIMBER FRAMING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 1684.2 "TIMBER FRAMED CONSTRUCTION". T.P. DECK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PUBLICATION FROM THE TIMBER PROMOTION COUNCIL " TIMBER DECKS - DESIGN AND CONSTRUCTION MANUAL".
6. FOOTINGS AND SLABS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 2870 "RESIDENTIAL SLABS AND FOOTINGS".
7. PLUMBING AND DRAINAGE SHALL BE IN ACCORDANCE WITH AS 3500.2 AND AS 3500.3 "THE NATIONAL PLUMBING AND DRAINAGE CODE". FIT ADJUSTABLE TEMPERING VALVES TO ALL ABLUTIONS IN ACCORDANCE WITH AS 1529 "CODE OF PRACTICE OF HOUSEHOLD TYPE HOT WATER SUPPLY SYSTEMS".
8. WATER PROOFING OF WET AREAS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS 3740 "WATERPROOFING OF WET AREAS IN RESIDENTIAL BUILDINGS".
9. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS/NZS 3000 "WIRING RULES". SMOKE ALARMS SHALL BE INSTALLED IN ACCORDANCE WITH TASMANIAN FIRE SERVICE AND AS 3786 "SMOKE ALARMS".
10. GLAZING SHALL BE IN ACCORDANCE WITH AS 1288 "GLASS IN BUILDINGS - SELECTION AND INSTALLATION", WINDOWS TO COMPLY WITH AS 2047 "WINDOWS IN BUILDINGS - SELECTION AND INSTALLATION".
11. MIN. R6.0 INSULATION TO CEILING. MIN. R2.5 INSULATION TO ALL EXTERNAL WALLS.
12. ALL STEELWORK SHALL BE IN ACCORDANCE WITH AS 4100 "STEEL STRUCTURES".

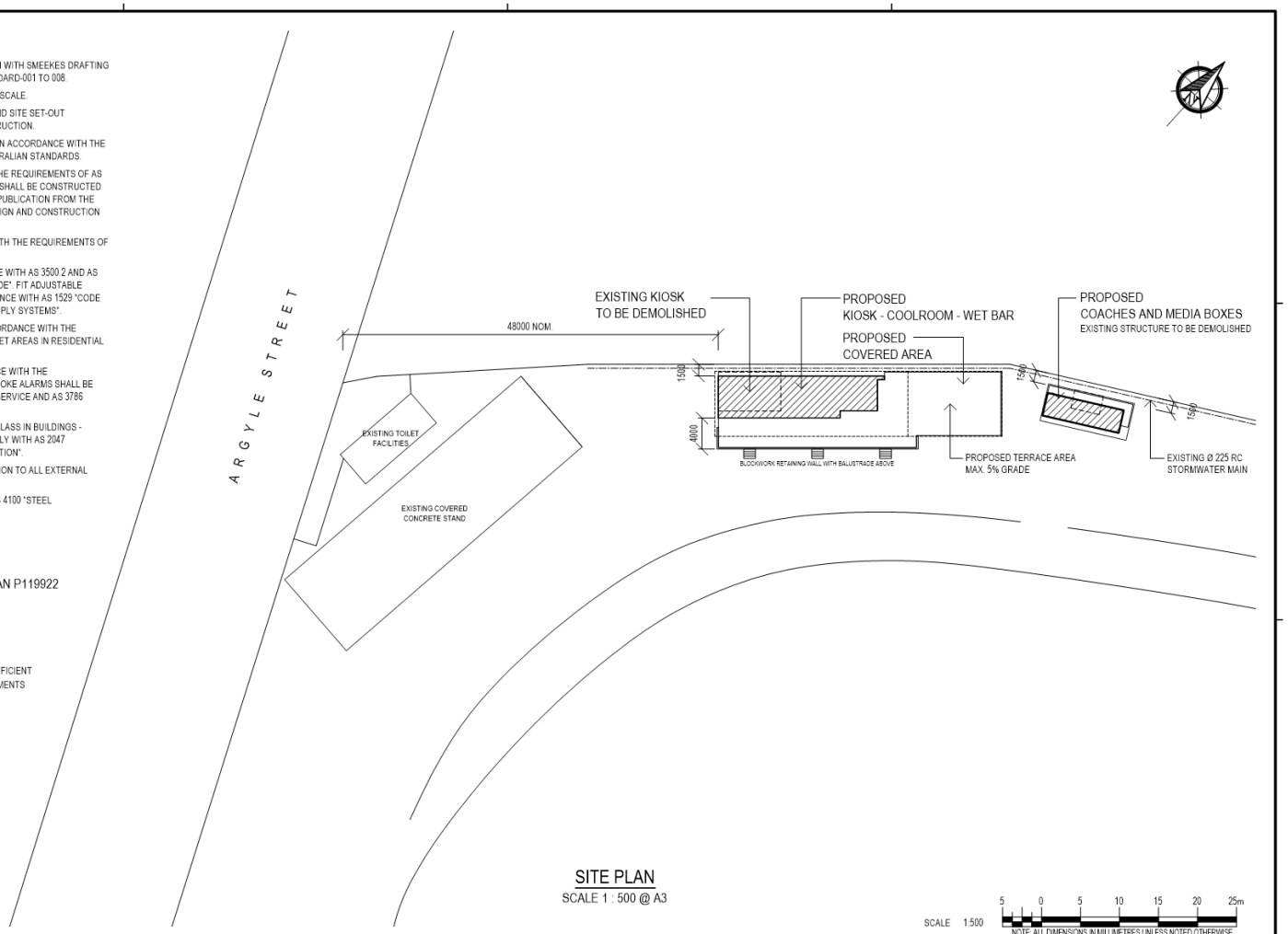
SITE DATA:

LAND TITLE REF. No.	: LOT 1 ON PLAN P119922
CLIMATE ZONE	: ZONE 7
DESIGN WIND SPEED	: 'N3'
SOIL CLASSIFICATION	: 'TBA'
BAL RATING	: BAL-LOW

THE RISK IS CONSIDERED TO BE VERY LOW (THERE IS INSUFFICIENT RISK TO WARRANT ANY SPECIFIC CONSTRUCTION REQUIREMENTS BUT THERE IS STILL SOME RISK.)

SITE COVERAGE:

LOT SIZE	: 35070.00 m²
KIOSK FOOTPRINT	: 106.90 m²



SITE PLAN
SCALE 1 : 500 @ A3

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

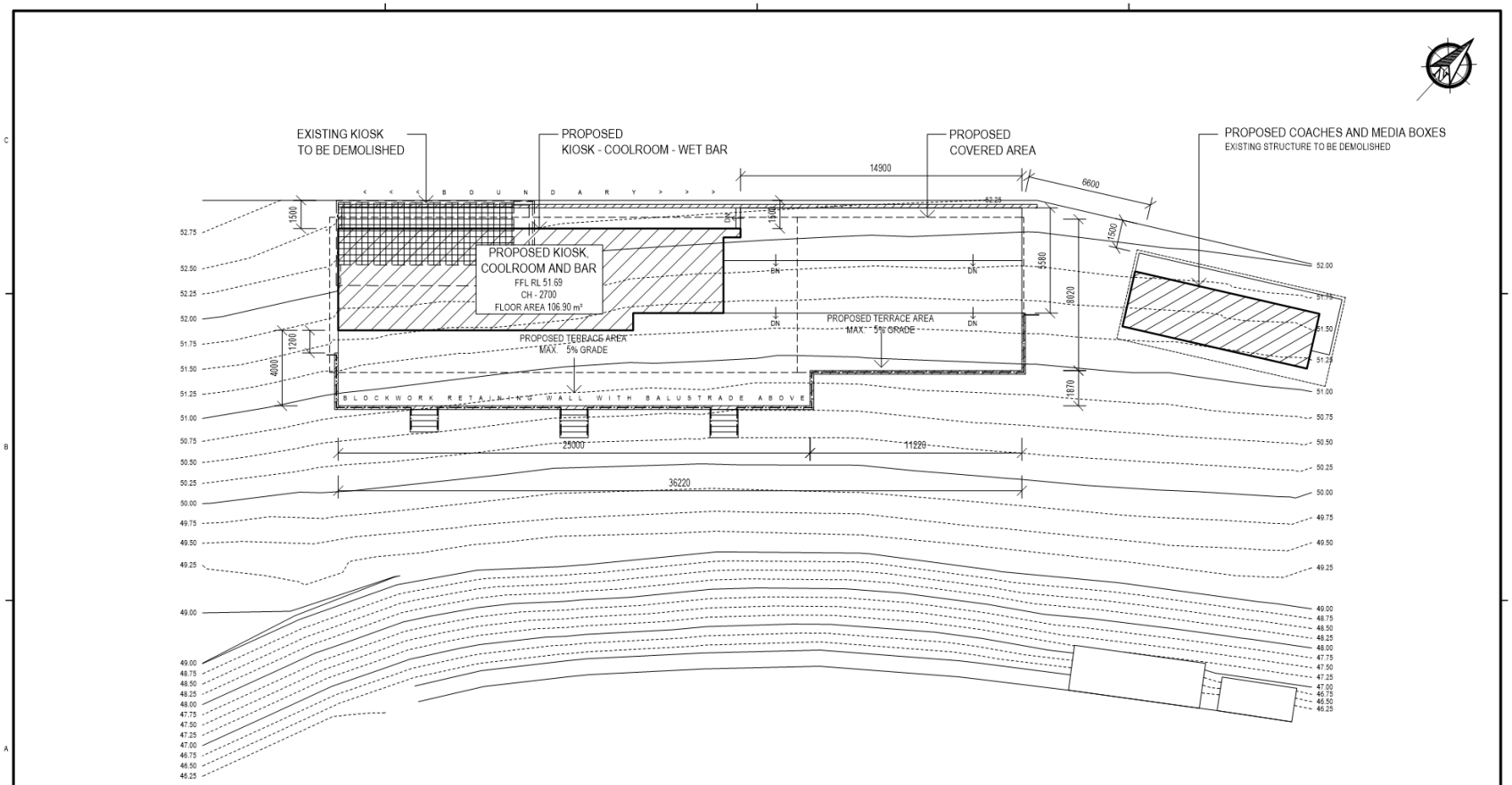
SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

SITE PLAN

ORG No.	SHT.	SCALE	
NHO_K	001	1 : 500	A3



PART SITE PLAN
SCALE 1 : 200 @ A3

SCALE 1:200
2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

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ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
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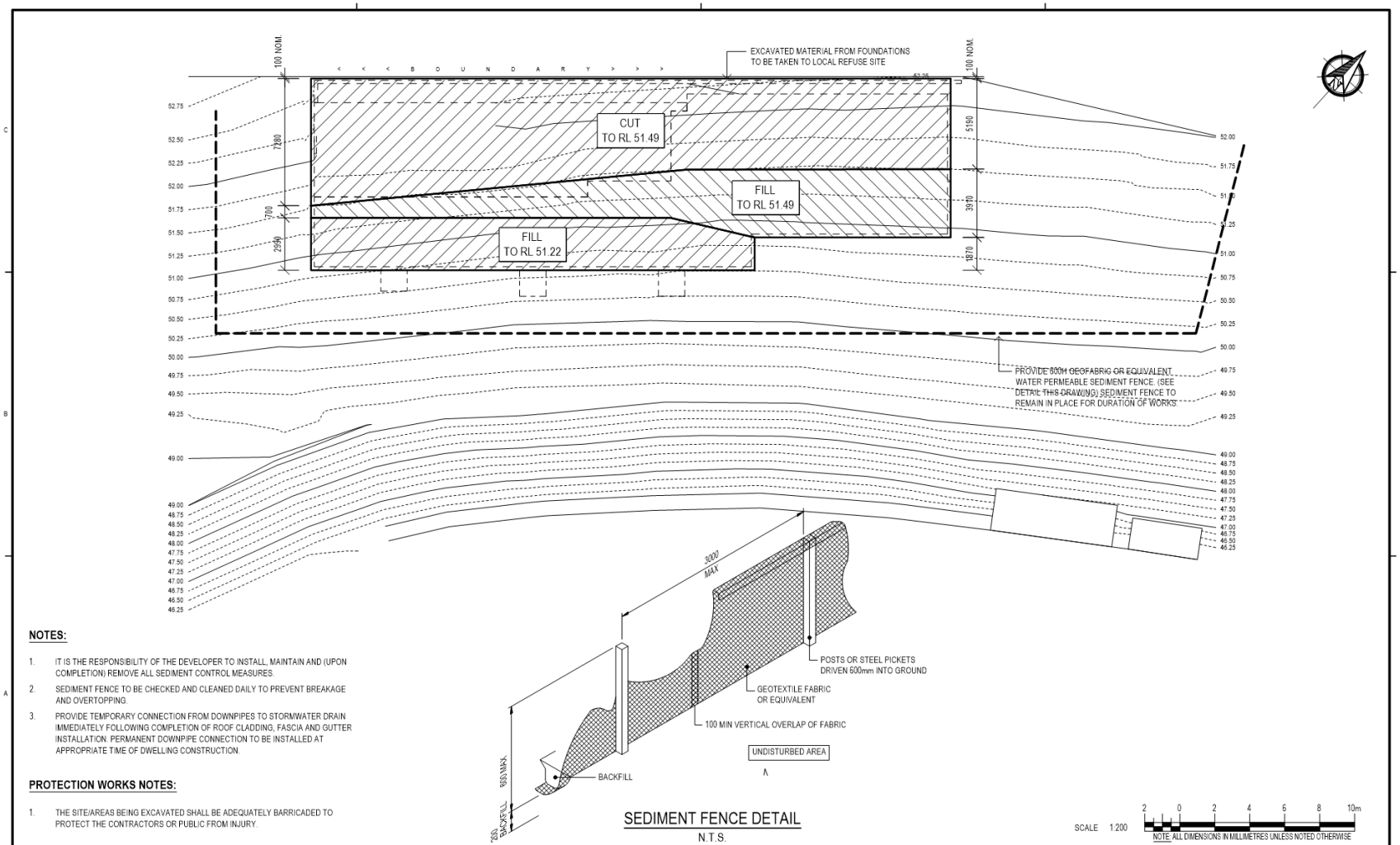
CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000

PART SITE PLAN

ORG No.	SHT.	SCALE	
NHO_K	002	1 : 200	A3



NOTES:

1. IT IS THE RESPONSIBILITY OF THE DEVELOPER TO INSTALL, MAINTAIN AND (UPON COMPLETION) REMOVE ALL SEDIMENT CONTROL MEASURES.
2. SEDIMENT FENCE TO BE CHECKED AND CLEANED DAILY TO PREVENT BREAKAGE AND OVERTOPPING.
3. PROVIDE TEMPORARY CONNECTION FROM DOWNPIPES TO STORMWATER DRAIN IMMEDIATELY FOLLOWING COMPLETION OF ROOF CLADDING, FASCIA AND GUTTER INSTALLATION. PERMANENT DOWNPIPE CONNECTION TO BE INSTALLED AT APPROPRIATE TIME OF DWELLING CONSTRUCTION.

PROTECTION WORKS NOTES:

1. THE SITE/AREAS BEING EXCAVATED SHALL BE ADEQUATELY BARRICADED TO PROTECT THE CONTRACTORS OR PUBLIC FROM INJURY.

SEDIMENT FENCE DETAIL
N.T.S.

SCALE 1:200
2 0 2 4 6 8 10m
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

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ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
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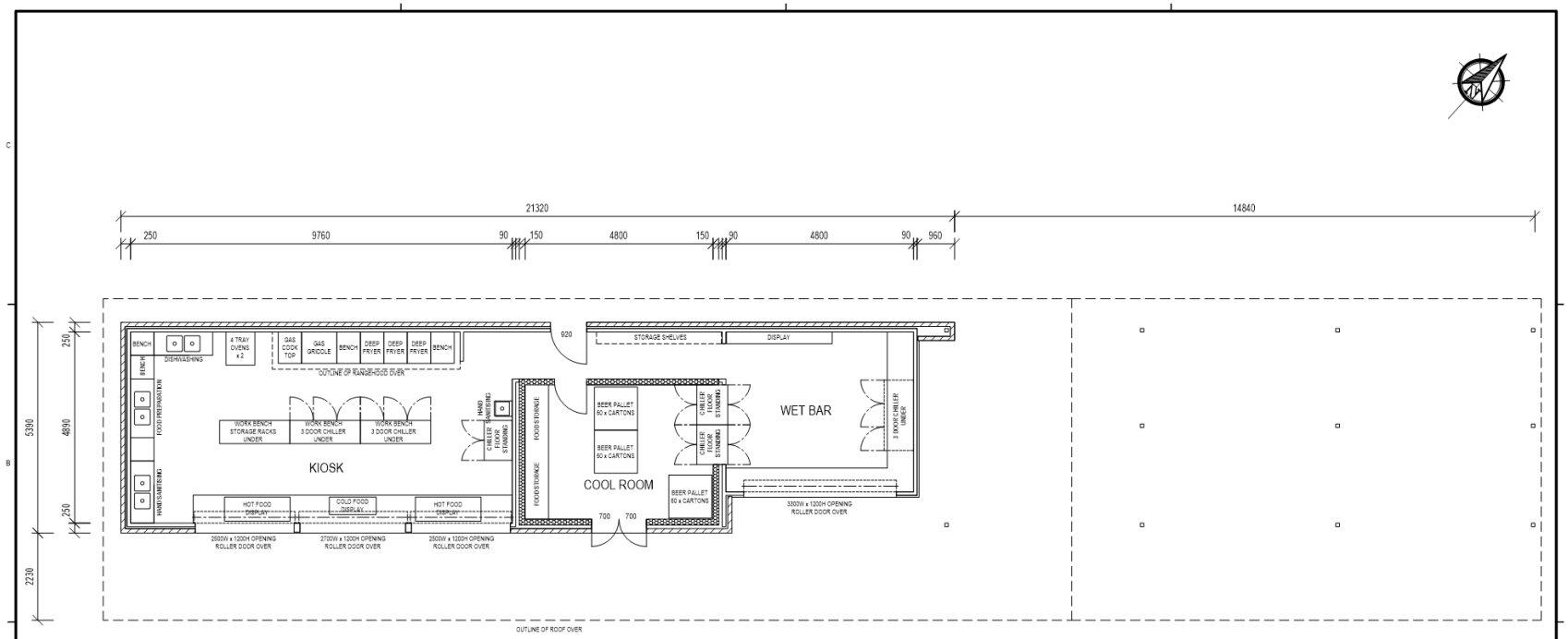
CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
CUT AND FILL PLAN /
SOIL AND WATER MANAGEMENT PLAN

ORG No.: NHO_K | SHT: 003 | SCALE: 1:200 | A3



FLOOR PLAN
SCALE 1 : 100 @ A3

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.

WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

A - AWNING
BF - BIFOLD DOOR
C - CUSTOM (BUTTED CORNER GLAZING)
F - FIXED
FR - FROSTED GLAZING
GB - GLASS BRICK
H - HINGED DOOR
S - SLIDING
SD - SLIDING DOOR
STKSD - STACKING TYPE SLIDING DOOR

FLOOR FINISHES LEGEND:

C - CARPET
CT - CERAMIC TILES
L - LINOLEUM
NC - NATURAL CONCRETE

SCALE 1:100
1000 0 1000 2000 3000 4000 5000mm
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2016

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

DRN / DES: R. SMEEKES

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ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
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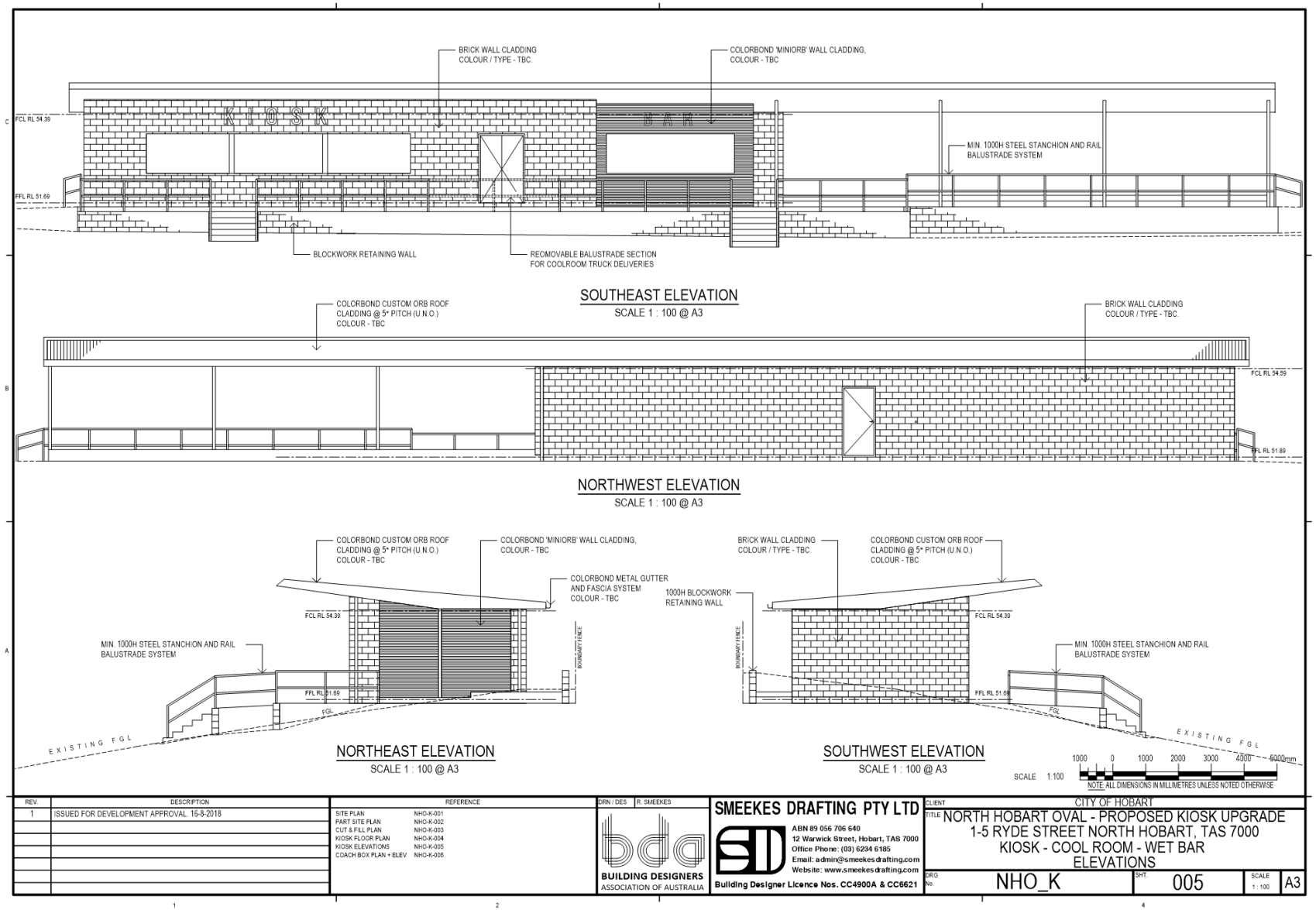
CLIENT: CITY OF HOBART
TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
FLOOR PLAN

DRG No.: NHO_K | SHT: 004 | SCALE: 1 : 100 | A3



REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH BOX PLAN + ELEV	NHO-K-006

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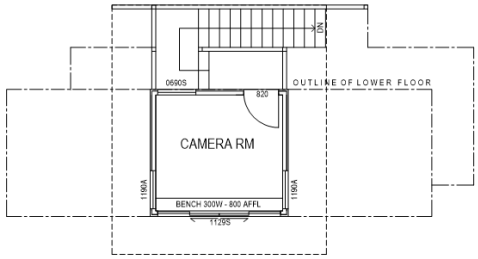
CLIENT CITY OF HOBART

TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
KIOSK - COOL ROOM - WET BAR
ELEVATIONS

ORG No. NHO_K | SHT. 005 | SCALE 1 : 100 | A3



LEVEL 2 (CAMERA ROOM) FLOOR PLAN
SCALE 1 : 100 @ A3

FLOOR FINISHES LEGEND:

- C - CARPET
- CT - CERAMIC TILES
- L - LINOLEUM
- NC - NATURAL CONCRETE

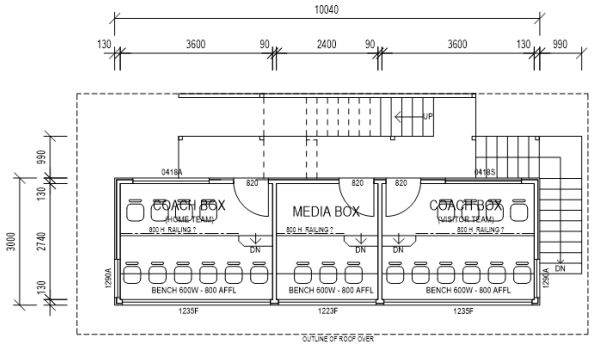
WINDOW LEGEND:

1 5 0 9 A
- TYPE
- WIDTH (900)
- HEIGHT (1500)

- A - AWNING
- BF - BIFOLD DOOR
- C - CUSTOM (BUTTED CORNER GLAZING)
- F - FIXED
- FR - FROSTED GLAZING
- GB - GLASS BRICK
- H - HINGED DOOR
- S - SLIDING
- SD - SLIDING DOOR
- STKSD - STACKING TYPE SLIDING DOOR

STAIRS / HANDRAIL NOTES:

1. CLOSED TIMBER STAIRS CONSTRUCTED IN ACCORDANCE WITH BCA PART 3.9.1
2. TREADS MUST HAVE A SLIP-RESISTANT FINISH OF A SUITABLE NON-SKID STRIP NEAR THE EDGE OF THE NOSINGS.
3. RISER AND GOING DIMENSIONS IN ACCORDANCE WITH BCA PART 3.9.1.4.
   RISER (R) MAX. 190 - MIN. 115
   GOING (G) MAX. 355 - MIN. 240
   SLOPE RELATIONSHIP
   2R + G MAX. 700 - MIN. 550
4. INSTALL HANDRAIL TO ONE SIDE OF FLIGHT IN ACCORDANCE WITH BCA PART 3.9.2.4.



LEVEL 1 (COACHES + MEDIA) FLOOR PLAN
SCALE 1 : 100 @ A3

SCALE 1:100

1000 0 1000 2000 3000 4000 5000mm

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL. 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
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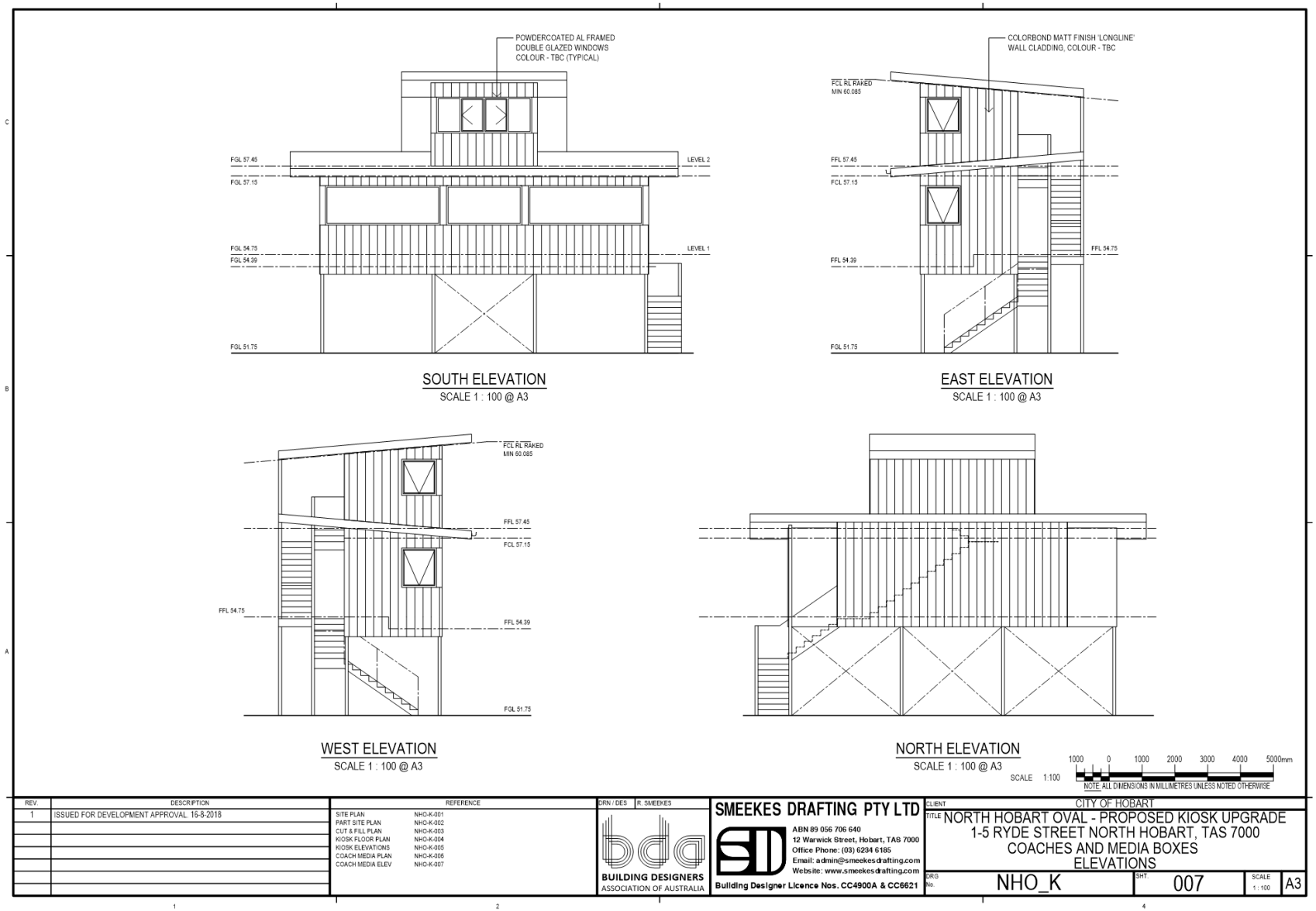
CLIENT CITY OF HOBART

TITLE NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
FLOOR PLANS

ORG No. NHO_K | SHT. 006 | SCALE 1 : 100 | A3



REV.	DESCRIPTION
1	ISSUED FOR DEVELOPMENT APPROVAL 16-8-2018

REFERENCE	
SITE PLAN	NHO-K-001
PART SITE PLAN	NHO-K-002
CUT & FILL PLAN	NHO-K-003
KIOSK FLOOR PLAN	NHO-K-004
KIOSK ELEVATIONS	NHO-K-005
COACH MEDIA PLAN	NHO-K-006
COACH MEDIA ELEV	NHO-K-007

DRN / DES: R. SMEEKES

BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

SMEEKES DRAFTING PTY LTD
ABN 89 056 706 640
12 Warwick Street, Hobart, TAS 7000
Office Phone: (03) 6234 6185
Email: admin@smeekesdrafting.com
Website: www.smeekesdrafting.com
Building Designer Licence Nos. CC4900A & CC6621

CLIENT: CITY OF HOBART

TITLE: NORTH HOBART OVAL - PROPOSED KIOSK UPGRADE
1-5 RYDE STREET NORTH HOBART, TAS 7000
COACHES AND MEDIA BOXES
ELEVATIONS

ORG No.	SHT.	SCALE	
NHO_K	007	1 : 100	A3

APPENDIX B

Site History Information Requests

Image source: National Library of Australia (TROVE) http://digital.sl.nsw.gov.au/delivery/DeliveryManagerServlet?embedded=true&toolbar=false&dps_pid=IE3692317

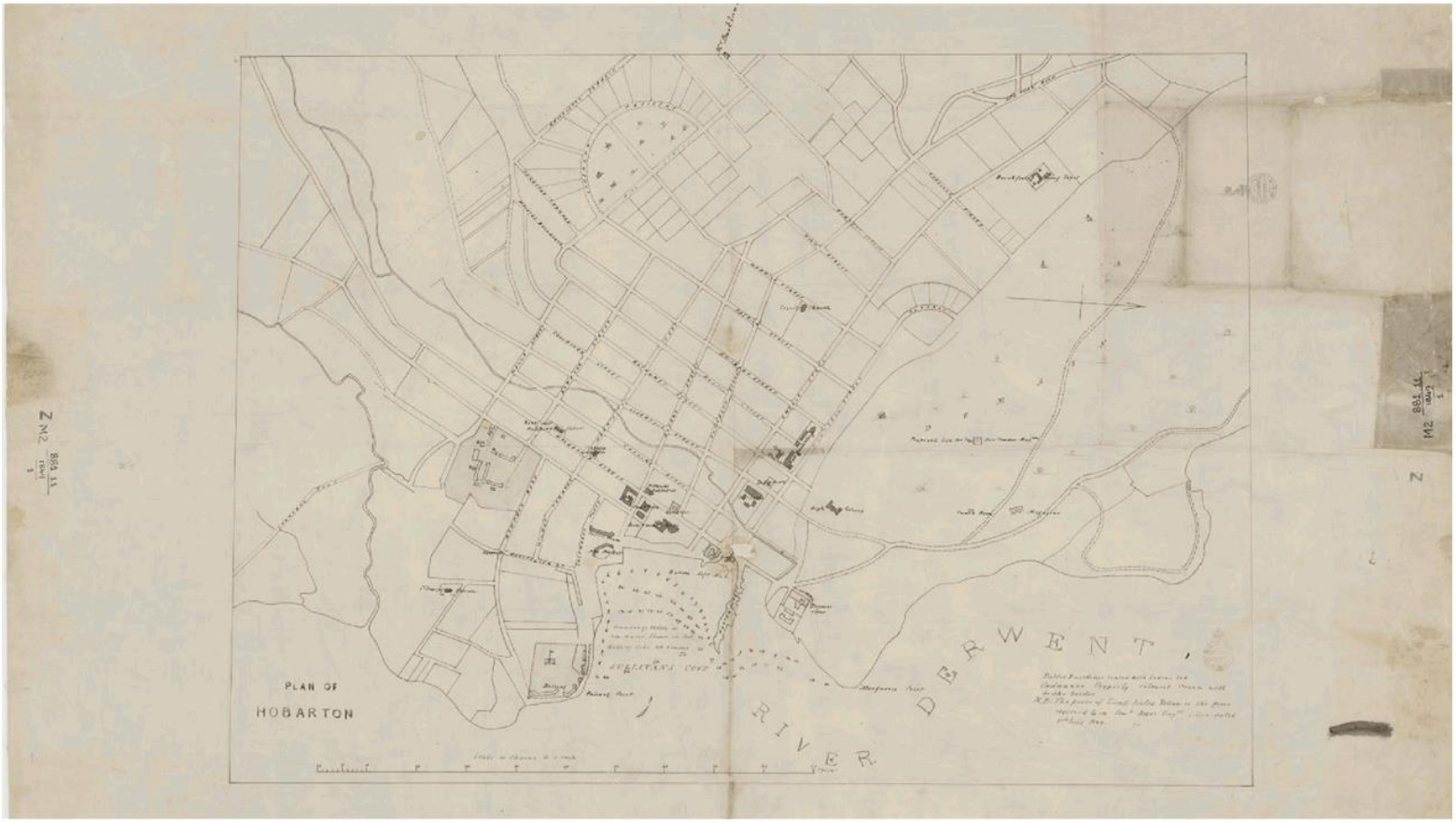


Image source: National Library of Australia (TROVE) http://digital.sl.nsw.gov.au/delivery/DeliveryManagerServlet?embedded=true&toolbar=false&dps_pid=IE3751304

Department of Justice – Dangerous Goods Records

Authority to Release Information to a Third Party Dangerous Substances Location

I, (full Name)
Paul Alexander Curtain, General Manager, North Hobart Football Club

authorise WorkSafe Tasmania to release information relating to Facility Number NA

Location of Facility (full address)
1-5 Ryde Street, North Hobart 7000

to (full Name)
Alex Lovibond

of (company Name)
Environmental Management & Consulting (EM&C)

Signature 30/8/2018 Date

Address
1-5 Ryde St, North Hobart

Phone	Mobile Phone	Email
	0409312889	gm@nhfc.net.au

- [x] Current manifest
- [x] Current site plan
- [x] All historical information
- [x] Contamination issues
- [x] Decommissioning details
- [x] Other (please give details below)

Other Information required
Application is made in response to North Hobart Football Club's development application on potentially contaminated land. EM&C are acting on our behalf to investigate our site for contamination issues arising from any potentially contaminating activities that may have occurred either on our occupied property, or the neighboring property located at 393 Argyle Street. If you could please search your records for both our site and the neighboring property that would be greatly appreciated.

For further assistance please contact:

Department of Justice
WorkSafe Tasmania
PO Box 56, Rosny Park, TAS 7018
Phone: (in Tasmania) 1300 366 322; (outside Tasmania) - 03 6166 4600; Fax 03 6173 0206
Email: wstinfo@justice.tas.gov.au Website www.worksafe.tas.gov.au

Tasmanian Government

SITE MANIFEST

WORKPLACE STANDARDS TASMANIA
ABN 36 388 980 563

2661 - NORTH HOBART FOOTBALL CLUB INC

1 - 5 RYDE STREET
NORTH HOBART

Licence 28325 valid from to

Class	Description	Type	Size	L	Unit	Qty	Location	
2.1	LP GAS	CYLS	0.110	Y	L	4	???	Unknown storage location code :
2.1	LP GAS	CYLS	0.110	Y	L	10	???	Unknown storage location code :
2.1	LP GAS	CYLS	0.450	Y	L	1	???	Unknown storage location code :

Based on the above quantities,
facility is a DSL,
file closed 10/8/2011 LW

WORKPLACE STANDARDS TASMANIA

Enquiries: Keven Williams
Phone: (03) 6233 7652
Fax: (03) 6233 8338
Email: Keven.Williams@dier.tas.gov.au
Our Ref: 2661

9th January 2006

North Hobart Football Club Inc.
PO Box 38
North Hobart
TASMANIA 7002

Dear Sir or Madam:

DANGEROUS GOODS ACT 1998

LICENCE TO KEEP DANGEROUS GOODS

NORTH HOBART FOOTBALL CLUB INC., ARGYLE STREET, NORTH HOBART

SITE NUMBER: 2661

This letter is to advise you that whilst we have received payment for the renewal of your licence to keep dangerous goods for the period of 01/07/2005 to 30/06/2006, we have not received your **completed** *Section 1 of the Declaration* on the *Notice for Payment* form. Without this form your licence cannot be processed and issued.

In order to assist you, please find enclosed *Section 1 of the Declaration* on the *Notice for Payment* form. Please ensure that you **complete and return** the form to this office **no later than Monday 23rd January 2006**.

If you are keeping dangerous goods above the exemption limits specified in Schedule 3 of the *Dangerous Goods (General) Regulations 1998* without a current licence you expose yourself to possible prosecution.

If you have any queries please do not hesitate to contact Leza Wardlaw on 6233 8353.

Thank you for your co-operation.

Yours faithfully

K J Williams

Keven J Williams
SECTOR LEADER – STANDARDS
Encl.

Tasmania

NOTICE for PAYMENT

for Licence to Keep Dangerous Goods

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES

WORKPLACE STANDARDS TASMANIA
ABN 36 388 980 563

For period 01/07/2005 to 30/06/2006

NORTH HOBART FOOTBALL CLUB INC
PO BOX 38
NORTH HOBART 7002

Licensee No. 6252
Site No. 2661
Licence No. 17913
ABN. 48467609482
ACN.

Site Location
NORTH HOBART FOOTBALL CLUB INC
ARGYLE STREET
NORTH HOBART 7000

L P GAS	0.440 KL
L P GAS	1.100 KL
L P GAS	0.450 KL

COPY

Total Amount Payable: $46.80

PD 01/07/05

No **Important Information**
Declaration must be completed and returned with payment

Please note that this Notice for Payment is not a licence to keep dangerous goods. A licence will only be issued when payment for the amount shown on this Notice is made and an "Application for a Licence" form is completed and returned to Workplace Standards Tasmania. Failure to make this payment and return the completed form will mean that the site location referenced above is not licensed and therefore in breach of Regulation 9 of the Dangerous Goods (General) Regulations 1998. Please ensure that you make prompt payment so as not to expose yourself to possible prosecution. This fee is excluded from GST by a Determination by the Treasurer under Division 81 of the GST Act 1999.

1. **Declaration must be completed and returned with payment (Please print)**
Is the information contained on this Notice correct? (tick appropriate box) Yes ☐ No* (see below) ☐

Full Name: _____ Signature: _____

Position: _____ Date: _____

*Minor changes can be made directly onto this notice, and returned with payment (do not detach slip), otherwise contact Workplace Standards Tasmania

2. **Please detach and return this slip with cash/cheque/credit card to:**
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
Workplace Standards Tasmania
30 Gordons Hill Road / PO Box 56
ROSNY PARK TAS 7018
Ph 1300 366 322 Fax (03) 6233 8338

or

any **Service Tasmania** outlet

Licensee No. 6252
Site No. 2661
Licence No. 17913
Service Tas Code: 302

Credit Card Details: Mastercard ☐ Visacard ☐ Bankcard ☐ Amount Paid: $ 46.80 PD 01/07/05

Credit Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiry Date: __/__

Cardholder's Name: *(Block Letters)*	Phone No:	Signature:

WORKPLACE STANDARDS TASMANIA

Enquiries: Leza Wardlaw
Phone: 03 6233 8353
Fax: 03 6233 8338
Email: Leza.Wardlaw@dier.tas.gov.au
Your Ref:
Our Ref: 2661

North Hobart Football Club Inc
PO Box 38
NORTH HOBART TAS 7002

Dear Sir/Madam

DANGEROUS GOODS ACT 1998

LICENCE TO KEEP DANGEROUS GOODS
NORTH HOBART FOOTBALL CLUB INC, ARGYLE STREET, NORTH HOBART
SITE NO. 2661

Thank you for the payment for the renewal of *Licence to Keep Dangerous Goods* for the above referenced site location for the period 01/07/2005 to 30/06/2006.

Unfortunately you overlooked completing Section 1 of the Declaration on the *Notice for Payment* form (original enclosed). Please arrange for this Section to be completed and return to Workplace Standards as this declaration is required for the licence to be processed and issued.

Yours faithfully

Daryl Gillie
SECTOR LEADER - STANDARDS

5 July 2005

~~SBS~~

(Please print)

Is the information contained on this Notice correct? (tick appropriate box) Yes ☐ No* (see below) ☐

Full Name: _____ Signature: _____

Position: _____ Date: _____

*Minor changes can be made directly onto this notice, and returned with payment (do not detach slip), otherwise contact Workplace Standards Tasmania

2. **Please detach and return this slip with cash/cheque/credit card to:**
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
Workplace Standards Tasmania
30 Gordons Hill Road / PO Box 56
ROSNY PARK TAS 7018
or any Service Tasmania outlet

- 1 JUL 2005
ROSNY

Licensee No. 6252
Site No. 2661
Licence No. 17913
Service Tas Code: 302

Credit Card Details: Mastercard ☐ Visacard ☐ Bankcard ☐ Amount Paid: $ **46.80**

1 - JUL 2005

Credit Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiry Date: ___/___

BY: 1693

Cardholder's Name: *(Block Letters)*	Phone No:	Signature:

(F)

1. **Declaration must be completed and returned with payment (Please print)**
Is the information contained on this Notice correct? (tick appropriate box) Yes ☑ No* (see below) ☐

Full Name: RUSSELL JAMES MANNING Signature:

Position: GENERAL MANAGER Date: 10/1/06.

*Minor changes can be made directly onto this notice, and returned with payment (do not detach slip), otherwise contact Workplace Standards Tasmania

2. **Please detach and return this slip with cash/cheque/credit card to:**
DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
Workplace Standards Tasmania
30 Gordons Hill Road / PO Box 56
ROSNY PARK TAS 7018
Ph 1300 366 322 Fax (03) 6233 8338

or
any **Service Tasmania** outlet

WORKPLACE STANDARDS TASMANIA 17 JAN 2006 ROSNY

Licensee No. 6252
Site No. 2661
Licence No. 17913
Service Tas Code: 302

Credit Card Details: Mastercard ☐ Visacard ☐ Bankcard ☐ Amount Paid: $ **46.80** PD 01/07/05

Credit Card Number: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Card Expiry Date: ___/___

Cardholder's Name: *(Block Letters)*	Phone No:	Signature:

Tasmania

DEPARTMENT of INFRASTRUCTURE, ENERGY & RESOURCES
WORKPLACE STANDARDS TASMANIA
GPO BOX 56 ROSNY PARK TAS 7018
TELEPHONE: 1300 366 322
OR (03) 6233 7657
FAX (03) 6233 8338

WORK PLACE STANDARDS TASMANIA 16 JUN 2003 ROSNY

APPLICATION FOR A LICENCE TO KEEP DANGEROUS GOODS (KEEPER'S LICENCE)
DANGEROUS GOODS ACT 1998
DANGEROUS GOODS (GENERAL) REGULATIONS 1998

PLEASE READ THE GUIDANCE NOTES ON THE REVERSE SIDE OF THIS PAGE FOR TERMS USED BEFORE COMPLETING THIS APPLICATION FORM

Please print in BLOCK letters

F

1. TYPE OF APPLICATION (Please tick a box)

Renewal of existing licence ☑ New licence ☐ Transfer of a licence ☐

For renewal or transfer please indicate the existing site number (shown on the Notice for Payment) 2661

2. INTENDED LICENSEE

Name (Business: incorporated company name, or the position and name of a senior person in the company. Private: the owners name)
NORTH HOBART FOOTBALL CLUB INC

ACN (business only)	ABN (business only)	Telephone	Fax
—	~~ABN 48 467 609 482~~	6234 3473	6231 2132

Mailing address (Street/PO Box)	Suburb	State & Postcode
PO BOX 38	NORTH HOBART	TAS 7002

Email NHFC @ SOUTHERNFOOTBALL.COM (Lower case)

I certify that the information contained on this application is accurate and correct:

Name (if same as above, please write 'as above') RUSSELL MANNING Position SECRETARY

Signature of licensee [signature] Date 12/6/03

3. DEPOT TO BE LICENSED (ADDRESS WHERE THE GOODS ARE STORED)

Business Trading Name (or the name of the owner of a private depot) North Hobart Football Club Inc

Street address of depot	Suburb	Postcode

Site telephone	Site fax	Name of occupier (or owner of a private store)

4. CONTACT DETAILS (provide details of the person who should be contacted about information contained in this form, if different to licensee)

Name	Position

Mailing address (Street/PO Box)	Suburb	State & Postcode

Telephone/Mobile	Fax

Email

GUIDANCE NOTES FOR TERMS USED IN THIS APPLICATION FORM

Please read these notes before completing the *Application to Keep Dangerous Goods (Keeper's Licence)* form.

dangerous goods	any substance prescribed as dangerous goods, or a substance or article determined by Workplace Standards Tasmania (the Competent Authority) in accordance with the Regulations, to be dangerous goods
depot/site	any store, warehouse, premises or land used for storing dangerous goods
keeper's licence	a licence issued by Workplace Standards Tasmania to a licensee to keep or store dangerous goods at a particular depot/site
licence	a keeper's licence in force under the *Dangerous Goods (General) Regulations 1998*
licensed depot	a depot in relation to which a licence is issued under the *Dangerous Goods (General) Regulations 1998*
licensee	the holder of a licence to keep dangerous goods. The licensee needs to be a legal entity, that is a company, or a natural person - someone who will assume responsibility for the dangerous goods at the depot to be licensed. The licensee does not need to be the occupier of the depot. The trading name of the business should not be entered here.
licensee number	the licence number issued by Workplace Standards Tasmania to licensees
occupier of a depot	means the person who occupies the depot/site such as a manager, employer, a site owner or tenant. The occupier does not have to be the same person as the licensee.
Regulations	*Dangerous Goods (General) Regulations 1998.* The Regulations applicable to this application form are Regulations 9(5) and 10(1).
site number	the site number allocated to a specific depot/site, issued by Workplace Standards Tasmania
street address of depot	street address of the depot/site where the dangerous goods will be kept. Please do not use a post office box number for the street address of the depot.

PLEASE FORWARD COMPLETED FORM TO:
WORKPLACE STANDARDS TASMANIA PO BOX 56 ROSNY PARK TAS 7018
PHONE: 1300 366 322 OR (03) 6233 7657 FAX: (03) 6233 8338

Issue date May 2003

Tasmania

DEPARTMENT *of*
INFRASTRUCTURE,
ENERGY *and* RESOURCES
WORKPLACE STANDARDS TASMANIA

Enquiries: Daryl Gillie
Phone: 6233 7662
Fax: 6233 8338
Email: Daryl.Gillie@dier.tas.gov.au
Your Ref:
Our Ref: 2661

25 January 2001

North Hobart Football Club
PO Box 38
NORTH HOBART TAS 7002

DANGEROUS GOODS ACT 1998

Dear Sir or Madam

RE: Site Number 2661 - Argyle Street, North Hobart

On or about 1 June 2000, an invoice was mailed to you for the renewal of your licence to keep dangerous goods up to the period ending 31 June 2001.

Workplace Standards Tasmania (WST) has no record of the payment of the licence fee, or receipt of notification in writing of any change in circumstances at the site that would indicate that you no longer have an obligation to be licensed.

Statement of account as at 31 August 2000 was forwarded to you during the first week of September 2000, to which WST still have no record of a response.

The circumstances that may have lead to no response from you could have included:-

1. You may have sold the premises, which is still operating with the dangerous goods storage as previously licensed. However, there may have been an oversight and change of ownership/transfer of ownership may not have been forwarded to WST.

2. The dangerous goods stored no longer exceed the licensable quantities listed in Schedule 3 of the [Dangerous Goods (General) Regulations 1998] ['Regulations'].

3. You may still own the site, but no longer operate a dangerous good storage facility. If this being the case you are required to notify WST and sign the appropriate statutory declaration. The declaration must state that the storage facility has been decommissioned and the site rehabilitated in accordance with the relevant Australian Standards or Code of Practice. A statutory declaration is enclosed. It should be noted that a dangerous goods facility which is no longer in use and not abandoned in the correct manner, is deemed to be an operative dangerous goods facility and requires licensing.

Should you require further information on the abandonment of a dangerous goods storage site please contact WST.

4. You are still operating a dangerous goods storage facility that is subject to the licensing requirements of the *Dangerous Goods Act 1998* and Regulations, and have failed for whatever reason to renew the licence.

   At present you are operating an unlicensed dangerous goods facility. This is in breach of sub-regulation 9(5) of the regulations, and carries a maximum penalty of 10 penalty units*.

   If WST does not receive renewal of the license or advice to reasons why a license is no longer required by 16 February 2001, officers of WST will visit your premises for the purpose of collecting evidence for forwarding to the Director for Public Prosecutions, with the recommendation that legal proceedings be initiated against you.

Please note, the granting of a licence to store dangerous goods:-

1. Places upon you the responsibility to ensure the storage facility is used and operated safely and that measures to deal with an emergency are in place and operational:- and

2. All staff receives the required and appropriate training in the safe operation of the facility and understands the required emergency procedures.

For further advice in relation to this matter please contact Workplace Standards Tasmania on 1300 366 322.

Yours faithfully

S J Hyam
DELEGATE of the COMPETENT AUTHORITY
Encl:

*** 1 penalty unit = $100.00**

A4 04/93 RATOR

THIS FORM MUST BE RETURNED WITH PAYMENT

FORM 5 Regulation 36 (5)

Dangerous Goods Act 1976

APPLICATION FOR LICENCE IN RESPECT OF PREMISES FOR KEEPING DANGEROUS GOODS

1. Applicant's full name North Hobart Football Club
2. Applicant's occupation
3. Postal address PO Box 38, North Hobart
4. Situation of premises to be licensed Argyle Street, North Hobart
5. Name of municipality and town or township within which, or within 5 kilometres of which, premises are situated Hobart
6. Name and total quantity to be kept—

Explosives (Class 1)

Name	Class	Compatibility Group	Maximum quantity
Gunpowder	1·1	D	kilograms
Blasting	1·1	D	kilograms
Propellants	1·1	C	kilograms
Detonating fuse	1·1	D	metres
Detonators	1·1	B	only

L.P. Gas (Class 2) 6 x 45 kg kilograms

Flammable liquids, Class 3·1 and Class 3·2 (petrol, &c.) kilolitres

Flammable liquids, Class 3·3 and Class 3·4 (kerosene, &c.) kilolitres

Other dangerous goods:

7. Total number of tanks and package storage areas installed 6 cylinders

I declare that the above statements and answers are true to the best of my knowledge and belief.

Dated this 2 ND day of April 1991

(Signed) DIRECTOR M.H.F.C

½ year fee

This Application, with Licence Fee of $10.00, *to be forwarded to the address below within 7 days—*

DIRECTOR OF MINES—Dept. of Resources and Energy, Division of Mines
BLIGH STREET (PO Box 56)
ROSNY PARK 7018

FOR OFFICE USE ONLY

File 2661	Receipt No. PAID 4 APR 1991		**Initials**
	Amount of Cash/Cheque	$	
Licence No. 12943	Date 10330		

1.8.90 M. C. REED, Government Printer, Tasmania K 8668

INSPECTION REPORT - 001

KEEPING DANGEROUS GOODS

MINES
File Ref. 26161
31 OCT 1990
Doc. Ref. 970
Action Officer | Initials
RAP
CB
Resubmit to | Date

FILE NO: N/k AREA CODE MBOL DATE 14.9.90

BUSINESS TRADING NAME:
North Hobart Football Club

OWNER/OCCUPIER:
As Above

POSTAL ADDRESS: P.O. Box 38
North Hobart

LOCATION OF STORAGE: Argyle St
North Hobart

Licence No. 12943 | Debtors No. A41050

APPROVAL DATE: 14.6.90 APPROVAL NO: 8257 INSPECTION DATE: 14.9.90

TYPE OF INSPECTION : APPROVAL/FOLLOW-UP/ROUTINE/NEW/ADDITIONAL [redacted]

RECOMMENDED FOR LICENSING: YES/~~NO~~ INSPECTOR: [signature]

REMARKS:

Name of dangerous goods	Class	No. of tanks	Size of tanks	O/G O/H U/G	No. of and type of pumps	No. of cylinders drums packages	Size of cylinders drums packages
L.P.Gas	2.1					6	45kg Total = 530l

RESUBMIT DATE: TO:

FORM 4 (Regulation 34)

TASMANIA

Rec 65168

Dangerous Goods Act 1976

№ 8257

$20

Fee: $10

GRANTED TO..... [redacted] .....

.....

.....

Approval of Site and Construction of Premises for Keeping Flammable Liquids or Dangerous Commodities or the Alteration thereof

---

Approval for the *site and construction/*alteration of the site and construction as shown on the approved plans and specifications of a *package/*storage area/*tank for the undermentioned flammable liquids and dangerous commodities, subject to the provisions of the *Dangerous Goods Act 1976*, and regulations being observed and subject to the undermentioned special conditions, situate at .....

.....North Hobart Football Club, Argyle Street, North Hobart.....

This approval is valid only for one year from the date of issue.

Date of issue.....14 June.....19.90....

.....
Chief Inspector of Explosives

.....
Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
LP Gas	2.1	6 x 45 kg Cylinders

SPECIAL CONDITIONS

.....

.....

.....

*Strike out if inapplicable

OW 450 I. C. CARTER, Acting Government Printer, Tasmania

File No. 2661
Date .....

Mining Engineer, BURNIE		M. Robertson, HOBART	✓
M. Heuson, LAUNCESTON		C. Gardner, HOBART	
J. Coffey, BURNIE		E. Garlick, HOBART	
D. Wildmore, LAUNCESTON			
P. Davis, HOBART			

Subject: North Hobart Football Club

Address: .....

Proposal: LPGAS 2x45kg

Quality of Plans acceptable YES ✓ NO ☐

May I have your Recommendation Please.

pp MGlead
Senior Dangerous Goods Inspector

Receipt No. 65168
Date 23.5.90

PLAN RECOMMENDATION REPORT

Premises Address: ARGYLE ST.

Owner: NORTH HOBART FOOTBALL CLUB.

Occupier and Use: COMMERCIAL CATERING

Plan Submitted By: [redacted]

Address: [redacted]

	PRODUCT	QUANTITY	CLASS
Proposal For:	LPG.	.510KL.	2.1

The above plans were checked, and Site inspected and the following is recommended.

Suitable for approval: YES.

Subject to: .....

.....

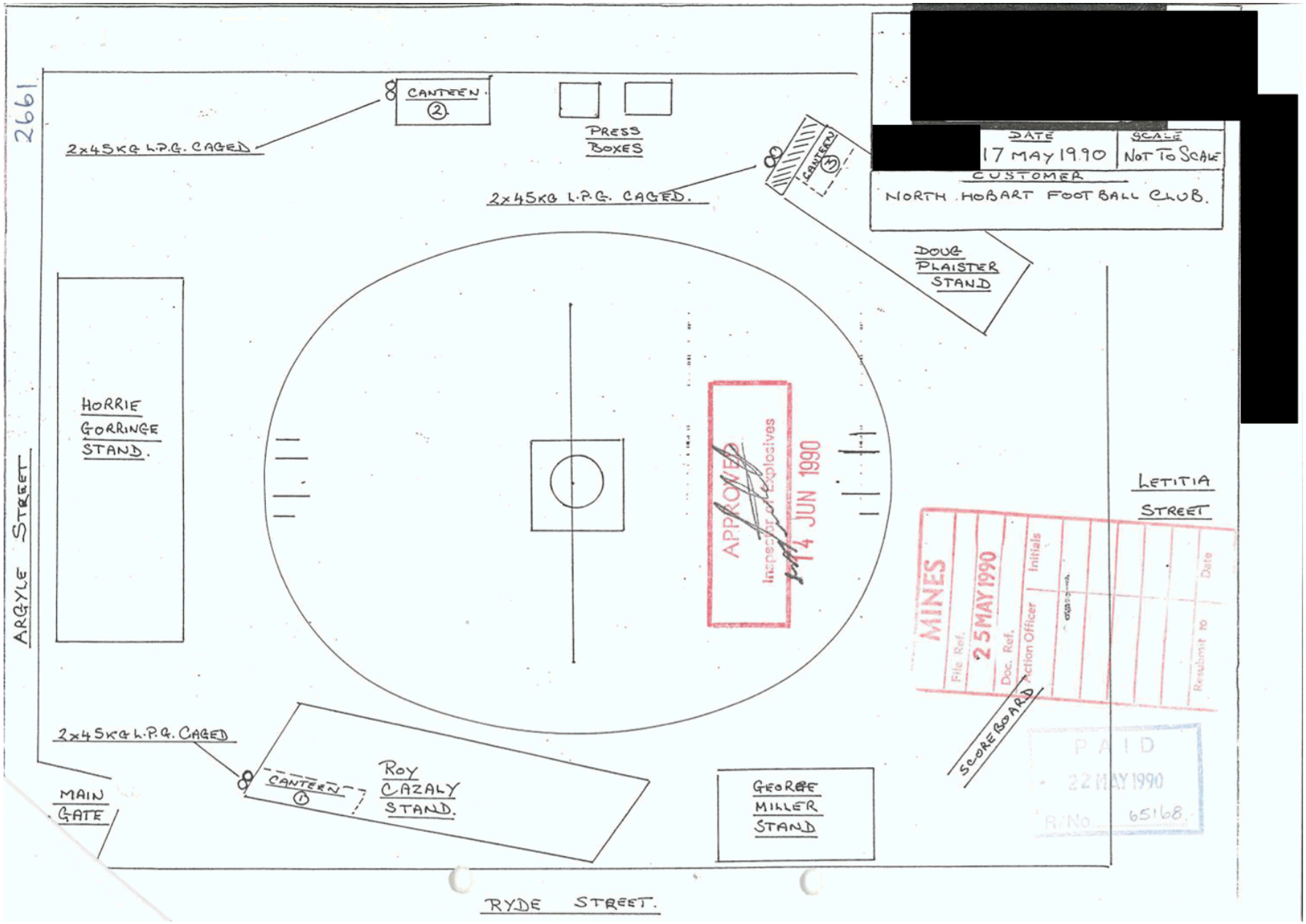
Not suitable for approval: .....

Reason: .....

.....

DANGEROUS GOODS INSPECTOR

Fee Attached YES ☐ NO ☐


2661
CANTEEN ②
PRESS BOXES
2x45KG L.P.G. CAGED
2x45KG L.P.G. CAGED.
CANTEEN ③
[redacted]
DATE
17 MAY 1990
SCALE
NOT TO SCALE
CUSTOMER
NORTH HOBART FOOT BALL CLUB.
DOUG PLAISTER STAND
HORRIE GORRINGE STAND.
ARGYLE STREET
APPROVED
Inspector of Explosives
14 JUN 1990
LETITIA STREET
MINES
File Ref.
25 MAY 1990
Doc. Ref.
Action Officer
Initials
Date
Resubmit to
SCOREBOARD
PAID
22 MAY 1990
R/No. 65168.
2x45KG L.P.G. CAGED
CANTEEN ①
ROY CAZALY STAND.
GEORGE MILLER STAND
MAIN GATE
RYDE STREET.

[redacted] To be licenced refer Approval No. 8257 dated 14.6.90

ORIGINAL

DEPT. OF MINES

TASMANIA

MINES File Ref. 17 MAY 1990 Doc. Ref. Action Officer MJR Resubmit to

No. 12013

START WORK NOTICE FOR L.P. GAS SYSTEMS

Applies to installations of fixed systems in any building, caravan or marine craft subject to the relevant A.L.P.G.A. Installation Codes and the S.A.A. L.P. Gas Code 1596—1973; and to any alteration of existing pipework subject to Section 2.5 of the S.A.A. L.P. Gas Code 1596—1973.

Installer [redacted] Registration No. [redacted]

Location of premises: North Hobart Oval Argyle St North Hobart

Owner: North Hobart Football Club

Address of owner N/A.

Type of premises: domestic*, commercial*, industrial*, caravan*, marine craft*.

Installation: new*, addition*, or repair*. Kiosk 1- 2x45kg Kiosk 2- 2x45 kg Kiosk 3- 2x45 kg

Signature of Installer: [redacted]

CERTIFICATE OF TEST

This installation has been installed*, altered*, and/or repaired* according to Regulations 44*, 45* and/or 46* of the Dangerous Goods Regulations 1976, and has been tested in accordance with Section 2.3 of the S.A.A. L.P. Gas Code AS 1596—1973.

Signature of Installer: [redacted] Date: 3/5/90.

GAS SUPPLIER'S ENDORSEMENT

To be completed in respect of new installations only.

The above installation has been inspected according to Section 2.4.1 of the S.A.A. L.P. Gas Code AS 1596—1973.

Name of Gas Supplier: [redacted]

Signature: [redacted]

* Delete whichever is not applicable.

33356 NAPP—143

Division of Mines & Mineral Resources
Dangerous Goods Inspectorate - 001 Inspection

Site No: 2661
Zone: MR01
Licence No:
Type: D
Status: L

Business Name: NORTH HOBART FOOTBALL CLUB
Owner Occupier: "DEMONS"
Site Address: ARGYLE ST
Site City: NORTH HOBART
Site State: _____ Pcode: _____
Supplier: [redacted]

Debtor No:
Debtor Name: [redacted]
Debtor Address: _____
Debtor City: _____
Debtor State: _____ Pcode: _____

Insp Date: 05-12-91 Inspector: RJR
Approval ✓ Follow Up ☐ Routine ☐ New ☐ Additional ✓
Approval Date: 04-12-91 Approval No: 344

Comments

DATA ENTRY

Add Site	☐	Increase Storage	✓
Modify Site	☐	Reduce Storage	☐
Cancel Site	☐	Routine	☐

Date 06/12/91
User [redacted]

MINES
File Ref. 2661
- 6 DEC 1991
Doc. Ref. 3194
Action Officer CB Initials
Resubmit to Date

STORAGE DETAILS

CODE	TYPE	SIZE	UNIT	QUANTITY	LOCN
LPG	CYL.	.380	KL	1	
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FORM 4 (Regulation 36 (4))

TASMANIA

344

111010

Dangerous Goods Act 1976

Approval of Site and Construction of Premises for Keeping Dangerous Goods or the Alteration of the Site and Construction of those Premises

Fee: $20
$50

GRANTED TO North Hobart Football Club

Argyle Street

NORTH HOBART TAS 7000

Approval for the *site and construction/*alteration of the site and construction as shown on the approved plans and specifications of premises for the undermentioned dangerous goods, subject to the provisions of the *Building Regulations* and the *Dangerous Goods Act 1976*, being complied with and subject to the undermentioned special conditions, situated at:

as above

This approval is valid for a period of one year from the date of issue.

Date of issue 4 December 19 91

Chief Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
LPG	2.1	190 kg

SPECIAL CONDITIONS

*Strike out if inapplicable

O/W 450 M. C. REED, Government Printer, Tasmania 1.8.90

Form 8

Regulations 46 (2)
47 (2) and 48 (2)

TASMANIA

4615

START WORK NOTICE FOR L.P. GAS SYSTEMS

This notice is required for the installation, alteration or repair of an L.P. Gas System in accordance with Regulations 46, 47 and 48 of the *Dangerous Goods Regulations 1990.*

Installer: [redacted] Registration No.: [redacted]

Installation Address: North Hobart Football Club. Social Club – Ryde Street North Hobart

Owner: North Hobart Football Club.

Address of Owner: A/A.

Supply Capacity: 1 x 190kg (Bulk Pipework In)

Type of system: domestic*, commercial*, industrial*, caravan*, ~~marine craft*~~, educational*, food van*, ~~hose test*~~.

Installation: new*, addition*, or ~~repair*~~.

Signature of Installer [redacted]

MINES DEPT. USE ONLY

MINES
File Ref. 2661
24 JAN 1992
Doc. Ref.

Action Officer	Initials
CB	
MR	
Resubmit to	Date

CERTIFICATE OF TEST

This installation has been installed*, ~~altered*~~, or ~~repaired*~~ in accordance with Regulations 46*, 47* or 48* of the *Dangerous Goods Regulations 1990* and has been tested in accordance with SAA L.P. Gas Code 1596 and compliance plate securely attached.

Signature of Installer: [redacted] Date: 25/1/91

GAS SUPPLIER'S/AGENTS ENDORSEMENT

To be completed in respect of new installations only.

The above installation has been inspected in accordance with the SAA L.P. Gas Code 1596 and compliance plate checked

Name of Gas Supplier/Agent: [redacted]

Signature [redacted] Dept. of Resources and Energy. Approval No. CCT4

* Delete whichever is not applicable.

ORIGINAL (White) Dept. of Mines
DUPLICATE (Green) Gas Supplier
TRIPLICATE (Blue) Gas Supplier, Dept. of Mines
QUADRUPLICATE (Pink) Customer
QUINTUPLICATE (Yellow) Book Copy

M. C. Reed, Government Printer, Tasmania K 7973

File No. 2661
Date 20.11.91

Mining Engineer, BURNIE		M. Robertson, HOBART	✓
M. Heuson, LAUNCESTON		C. Gardner, HOBART	
J. Coffey, BURNIE		E. Garlick, HOBART	
D. Wildmore, LAUNCESTON			
P. Davis, HOBART			

Subject: NORTH HOBART FOOTBALL CLUB
Address: ARGYLE ST NORTH HOBART
Proposal: 1 x 190 LPG.

Quality of Plans acceptable YES ✓ NO

May I have your Recommendation Please.

.....
Senior Dangerous Goods Inspector

Receipt No. 111010
Date 20.11.91

PLAN RECOMMENDATION REPORT

Premises Address: ARGYLE ST NORTH HOBART
Owner: N/HOBART F.B.C.
Occupier and Use:
Plan Submitted By: [redacted]
Address: [redacted]

	PRODUCT	QUANTITY	CLASS
Proposal For:	LP.G.	190KG	2.1

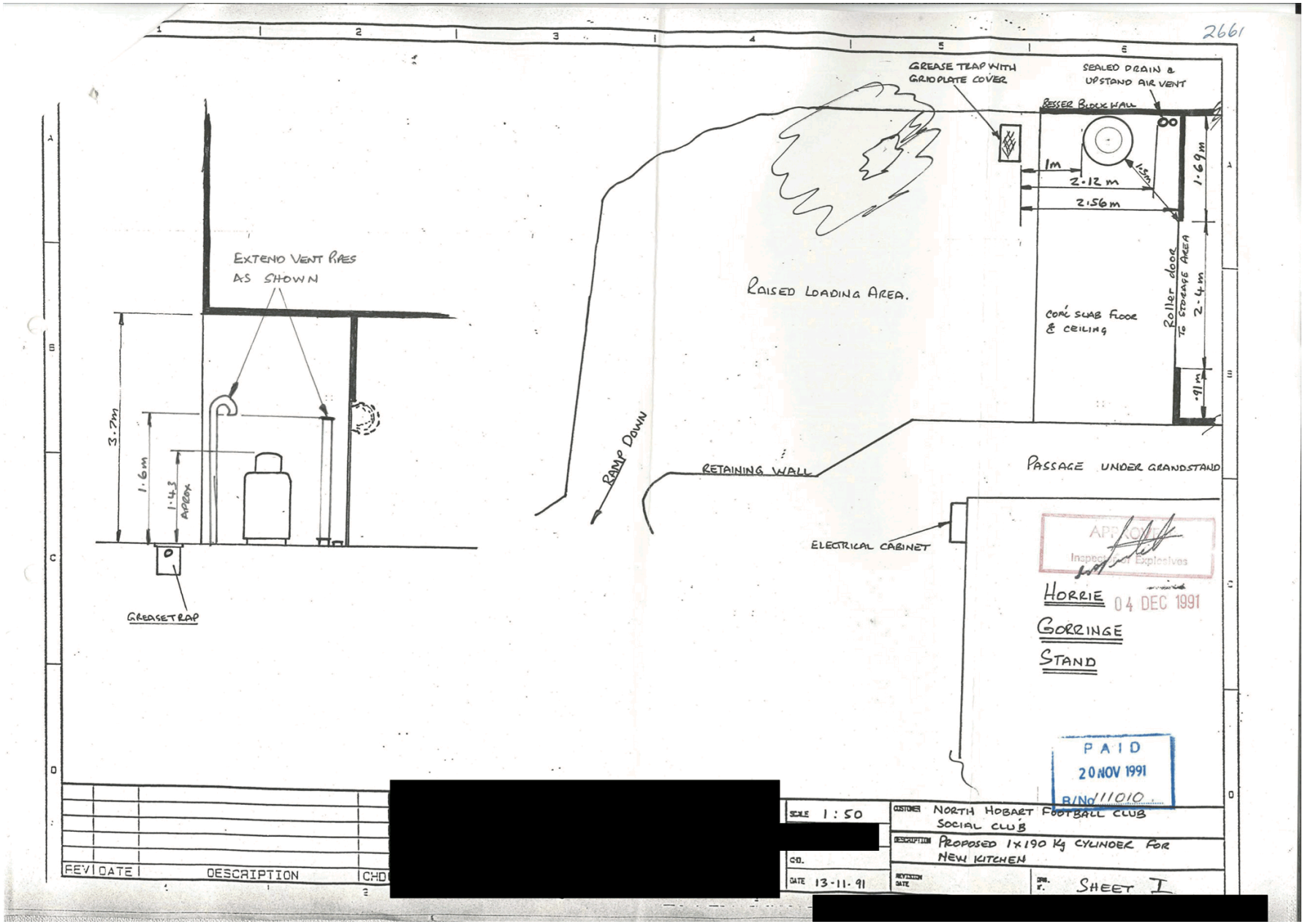
The above plans were checked, and Site inspected and the following is recommended.

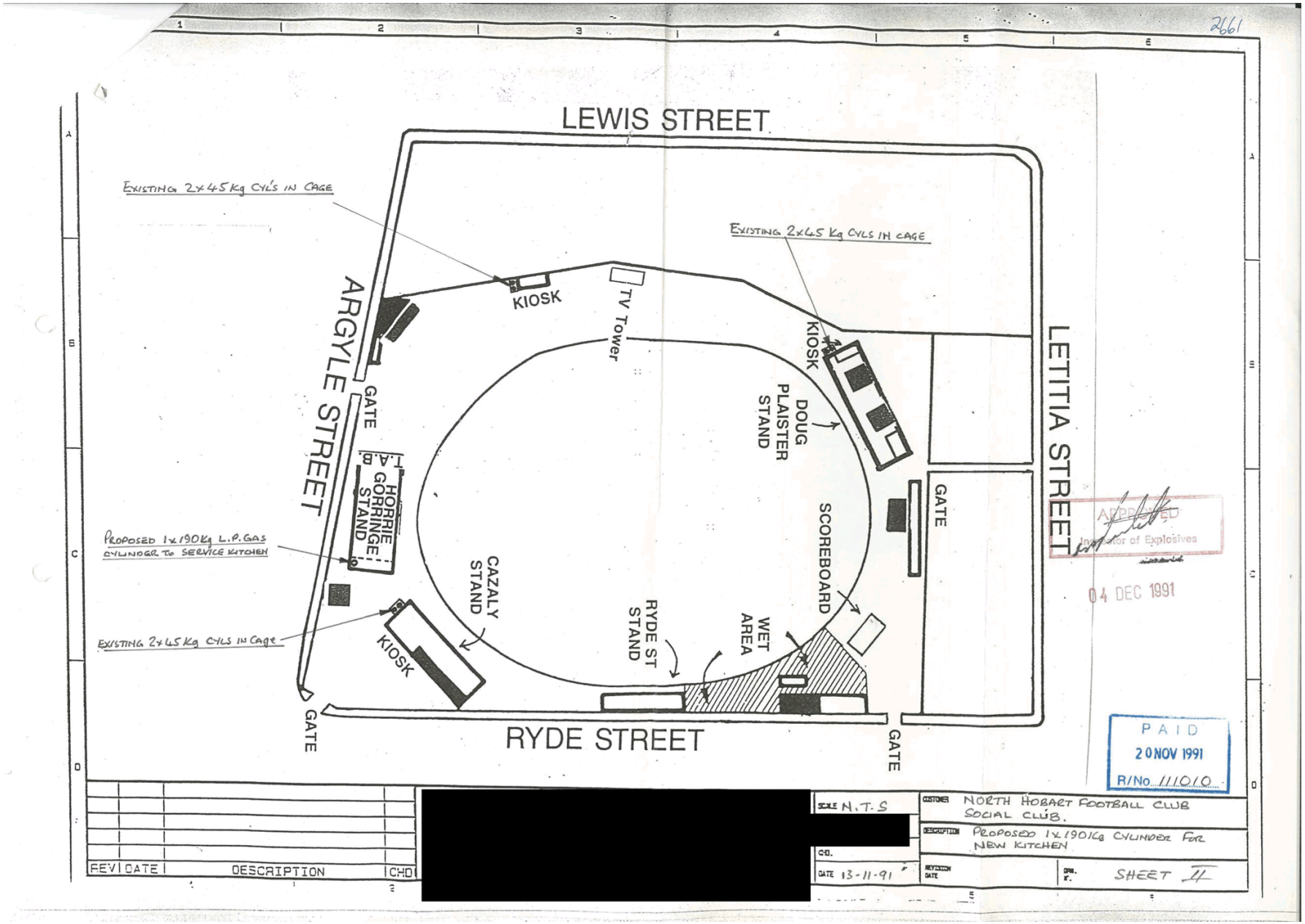
Suitable for approval: YES
Subject to:
Not suitable for approval:
Reason:

DANGEROUS GOODS INSPECTOR:

Fee Attached YES NO

MINES
File Ref. 2661
28 NOV 1991
Doc. Ref. 3997
Action Officer CB Initials
Resubmit to Date


2661
GREASE TRAP WITH GRIDPLATE COVER
SEALED DRAIN & UPSTAND AIR VENT
BESSER BLOCK WALL
1m
2·12 m
2·56 m
1·69m
1·5m
EXTEND VENT PIPES AS SHOWN
RAISED LOADING AREA.
CONC SLAB FLOOR & CEILING
ROLLER DOOR TO STORAGE AREA
2·4m
·91m
3·7m
1·6m
1·43 APPROX
RAMP DOWN
RETAINING WALL
PASSAGE UNDER GRANDSTAND
ELECTRICAL CABINET
GREASE TRAP
APPROVED
Inspector of Explosives
HORRIE 04 DEC 1991
GORRINGE
STAND
PAID
20 NOV 1991
B/No 111010
REV DATE DESCRIPTION CHD
SCALE 1:50
CO.
DATE 13-11-91
CUSTOMER NORTH HOBART FOOTBALL CLUB SOCIAL CLUB
DESCRIPTION PROPOSED 1x190 Kg CYLINDER FOR NEW KITCHEN
REVISION DATE
DRG. Nr. SHEET 1


2661
LEWIS STREET
EXISTING 2x45 Kg CYLS IN CAGE
EXISTING 2x45 Kg CYLS IN CAGE
KIOSK
TV Tower
KIOSK
ARGYLE STREET
GATE
DOUG PLAISTER STAND
HORRIE GORRINGE STAND
SCOREBOARD
GATE
LETITIA STREET
PROPOSED 1x190Kg L.P. GAS CYLINDER TO SERVICE KITCHEN
CAZALY STAND
RYDE ST STAND
WET AREA
EXISTING 2x45 Kg CYLS IN Cage
KIOSK
GATE
RYDE STREET
GATE
APPROVED
Inspector of Explosives
04 DEC 1991
PAID
20 NOV 1991
R/No. 111010
REV DATE DESCRIPTION CHD
[redacted]
SCALE N.T.S
CUSTOMER NORTH HOBART FOOTBALL CLUB SOCIAL CLUB.
DESCRIPTION PROPOSED 1x190Kg CYLINDER FOR NEW KITCHEN
CHD.
DATE 13-11-91
REVISION DATE
DRG. No. SHEET 1

[redacted]

Declaration of Installation Compliance.

I, [redacted] (Fitter)/ ~~Engineer~~, employee (contractor) to [redacted] hereby declare that the installation completed at:

NORTH HOBART FOOTBALL CLUB

RYDE ST N/HOBART

has been installed in accordance with the approval conditions of the issued licence to store dangerous goods. SITE LICENCE NO. 1910

In addition to this the installation complies with the requirements of the Dangerous Goods Regulations 1994.

Signature [redacted] Date: 11/2/98

Checklist:

Licence sighted:	(Yes) N/A
Installed in accordance with plan:	(Yes) N/A
Complies with AS1596:	(Yes) N/A
Complies with A.G.A. Codes:	(Yes) N/A
Start Work Notice completed:	(Yes) N/A

Countersigned:

[redacted]

This declaration has been signed before me: .....

Signature: [redacted] Date: 11/2/98

Title: .....

FORM 4

(Regulation 52)

TASMANIA

1910

Dangerous Goods Act 1976

Rec No. 175280

Approval of Site and Construction of Premises for Keeping Dangerous Goods or the Alteration of the Site and Construction of those Premises

GRANTED TO: [redacted]

Fee: $50

Approval for the site and construction as shown on the approved plans and specifications of premises for the undermentioned dangerous goods, subject to the provisions of the Building Regulations and the Dangerous Goods Act 1976, being complied with and subject to the undermentioned special conditions, situated at:

North Hobart Football Club
Ryde Street
NORTH HOBART Site: 2661

This approval is valid for a period of one year from the date of issue.

Date of issue: 18 March 1997

.....
Chief Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
L P Gas	2.1	4 x 45 KG

SPECIAL CONDITIONS

Compliance with Dangerous Goods Regulations and in particular AS 1596.

PLACARDING REQUIRED

HAZCHEM	
2WE	

ICATION FORM

APPLICATION FOR LICENCE TO STORE DANGEROUS GOODS

PART A - APPLICANT AND PREMISES DETAILS 1910

1. INTENDED LICENSEE

NAME: North Hobart Football Club

MAILING ADDRESS: PO Box 38

NORTH HOBART POSTCODE [redacted]

SIGNATURE: ..... DATE: .....

CONTACT NAME: ..... PH: ..... FAX: .....

2. PREMISES TO BE LICENSED

BUSINESS TRADING NAME: As Above

ADDRESS: Rydc Street North Hobart
LOT NO. STREET NO.

TOWN: ..... POST CODE: 7000

NATURE OF BUSINESS: Sports Club

PURPOSE OF STORAGE: cooking / Hot Water

SHIRE/LOCAL AUTHORITY: Hobart City Council

OFFICE USE ONLY

3. PLANS SUBMITTED BY

NAME: [redacted]

ADDRESS: [redacted]

TOWN: [redacted] POST CODE: [redacted]

ATTENTION: [redacted]

Issue Date 16.

4. OTHER DETAILS

	YES	NO
PLANS ACCEPTABLE	☑	☐
RECOMMENDED FOR APPROVAL:	☑	☐

RECEIPT NO: 175280 DATE: 175280

5. REMARKS:

COMPLIANCE WITH DANGEROUS GOODS REGULATIONS AND IN PARTICULAR AS 1596.

Section 5.49.

6. PLACARDING REQUIRED:

HAZCHEM

2WE | F-Gas 2

OR CONTACT LOCAL OFFICE

CSS INSPECTOR: ..... DATE: .....

SENIOR CSS INSPECTOR: ..... DATE: 17.3.97

DETAILS OF PROPOSED STORAGE

...RRECT TECHNICAL NAME OF GOODS	UN No.	CLASS	SUB-RISK	PACKAGING GROUP	AMOUNT (kilolitres /tonnes)
LPG	1075	2.1	-	-	1.6 Kl

Issue Date 10/6/

TECHNICAL INFORMATION FOR SOME COMMON DANGEROUS GOO

CORRECT TECHNICAL NAME	UN No	CLASS	SUB-RISK	PACKAG GROU
ACETIC ACID SOLUTION (10-80% acid w/w)	2790	8	-	II
ACETONE	1090	3	-	II
ACETYLENE, DISSOLVED	1001	2.1	-	-
ARGON, COMPRESSED	1006	2.2	-	-
AEROSOLS (greater than 1 litre capacity)	1950	2.1 or 2.2	variable	-
AEROSOLS (less than 1 litre capacity)	1950	9	-	-
AMMONIA, ANHYDROUS, LIQUEFIED (greater than 50% ammonia)	1005	2.3	-	-
AMMONIUM NITRATE (common explosives grade)	1942	5.1	-	III
AMMONIUM NITRATE (common fertiliser grade)	2067	5.1	-	III
BATTERIES, WET, FILLED WITH ACID	2794	8	-	III
BATTERY FLUID, ACID	2796	8	-	II
CAUSTIC SODA - see SODIUM HYDROXIDE				
CARBON DIOXIDE	1013	2.2	-	-
CALCIUM HYPOCHLORITE, mixtures, dry	2208	5.1	-	II
CHLORINE	1017	2.3	5.1	-
DIESEL / DISTILLATE	-	3	-	-
ETHYL METHYL KETONE (MEK)	1193	3	-	II
HYDROCHLORIC ACID	1789	8	-	II
KEROSENE	1223	3	-	III
LIQUEFIED PETROLEUM GAS (LPG)	1075	2.1	-	-
NATURAL GAS, COMPRESSED	1971	2.1	-	-
NITRIC ACID (less than 70%)	2031	8	-	II
NITRIC ACID (greater than 70%, except red fuming)	2031	8	5.1	I
NITROGEN, COMPRESSED	1066	2.2	-	-
NITROUS OXIDE, COMPRESSED	1070	2.2	5.1	-
OXYGEN, COMPRESSED	1072	2.2	5.1	-
PETROL	1203	3	-	II
ROUNDUP - not dangerous goods	-	-	-	-
SODIUM CYANIDE	1689	6.1	-	I
SODIUM ETHYL XANTHATE	3134	4.3	6.1	III
SODIUM HYDROXIDE (solid)	1823	8	-	II
SODIUM HYPOCHLORITE (5% - 16% available chlorine)	1791	8	-	III
SODIUM NITRATE	1498	5.1	-	III
SULFUR (solid)	1350	4.1	-	III
SULFUR DIOXIDE, LIQUEFIED	1079	2.3	-	-
SULFURIC ACID (all concentrations except fuming and spent)	1830	8	-	II
TOLUENE	1294	3	-	II
TOLUENE DI-ISOCYANATE (TDI)	2078	6.1	-	II
TURPENTINE	1299	3	-	III
SPRAYSEED Herbicide	3016	6.1	-	III

DANGEROUS GOODS ACT 1976 AND REGULATIONS 1994

PLAN APPROVAL CHECKLIST

APPROVED TO DANGEROUS GOODS REGULATION NO. 52 (1) Approval of Depot 1994

REQUIREMENT	COMPLETED (Y/N)	COMMENTS
Plans in triplicate	Yes	
Scale not less than 1:250	Yes	
Correct fee paid	Yes	
Plan shows:		
• storage areas	Yes	
• tanks	Yes	cylinders
• loading / filling stations	Yes	
• pumps / pipelines	Yes	
• fire hydrants	Yes	
• elect. installations	Yes	
• roads	Yes	
• railways	N.A	
• magazines	N.A	
• buildings in depot	Yes	
D'Goods Manifest	Yes	
• quantity	Yes	
• class/s	Yes	
• UN NOs.	Yes	
• HAZCHEM placarding reqd.	Yes.	
Additional comments / recommendations		
Plans recommended for approval.		
Officer :		
Site no.: 2661		
Date: 15/4/97		

pcd/checkdoc

DANGEROUS GOODS INSPECTORATE

53922

001 Inspection

FILE REF. 2661
- 8 JAN 1996
EXCC. REF. 53922

OFFICER	FOR ACTION	FOR INFO.
CB		9/1
REFERRED TO	DATE	

Inspection date 05 01 96 Inspector MR

Approval ☐ Follow up ☐ Routine ☐ New ☑

Approval date 11 09 95 Additional ☑

Approval No. 15548

Site No. 2661 Business Name: NORTH HOBART FOOT BALL CLUB

Zone MR 011 Owner/Occupier:

Licence No. Site Address: ARGYLE ST

Type C Site City: NORTH HOBART Postcode

Location ☐ Supplier:

Debtor No. Debtor Name:

Debtor Address:

Debtor City: Postcode

Comments:

CODE	TYPE	SIZE	LICENCEABLE Y/N	UNIT	QUANTITY	LOCATION
LPG	CYLS	111	Y	KL	4	

DATA ENTRY

Add Site ☐ Increase Storage ☑ Date 09 01 96

Modify Site ☐ Reduce Storage ☐ User CBL

Cancel Site ☐ Routine ☐

FORM 4 (Regulation 36 (4))

TASMANIA

1548

Dangerous Goods Act 1976

Rec No. 161919

Approval of Site and Construction of Premises for Keeping Dangerous Goods or the Alteration of the Site and Construction of those Premises

GRANTED TO: [redacted] **Fee: $50**

Approval for the *alteration of the site and construction as shown on the approved plans and specifications of premises for the undermentioned dangerous goods, subject to the provisions of the Building Regulations and the Dangerous Goods Act 1976, being complied with and subject to the undermentioned special conditions, situated at:

North Hobart Football Club
Argyle Street
HOBART TAS 7000 Site: 2661

This approval is valid for a period of one year from the date of issue.

Date of issue: 11.9.95

.....
Chief Inspector of Explosives

Dangerous Goods:

Name	Class	Quantity
LPG	2.1	4 x .11 KL

SPECIAL CONDITIONS

Subject to : 1. Placarding of site.
2. All cylinders to be enclosed.

PLAN RECOMMENDATION REPORT

File No.: 2661 Inspector: M Roberts Date: 24-8-95

	Product	Quantity	Class
Proposal for:	LPG.	4 x 11 KL.	2.1

Business Name: North Hobart Football Club

Owner/Occupier:

Premises Address: Argyle Street, Hobart 7000

Correspondence Address (if different from above)

PLANS

Plans submitted by: [redacted]

Address:

Receipt No.: 161979 Date: 24-8-95

Quality of plans acceptable: YES ☑ NO ☐

Suitable for approval: YES ☑ NO ☐

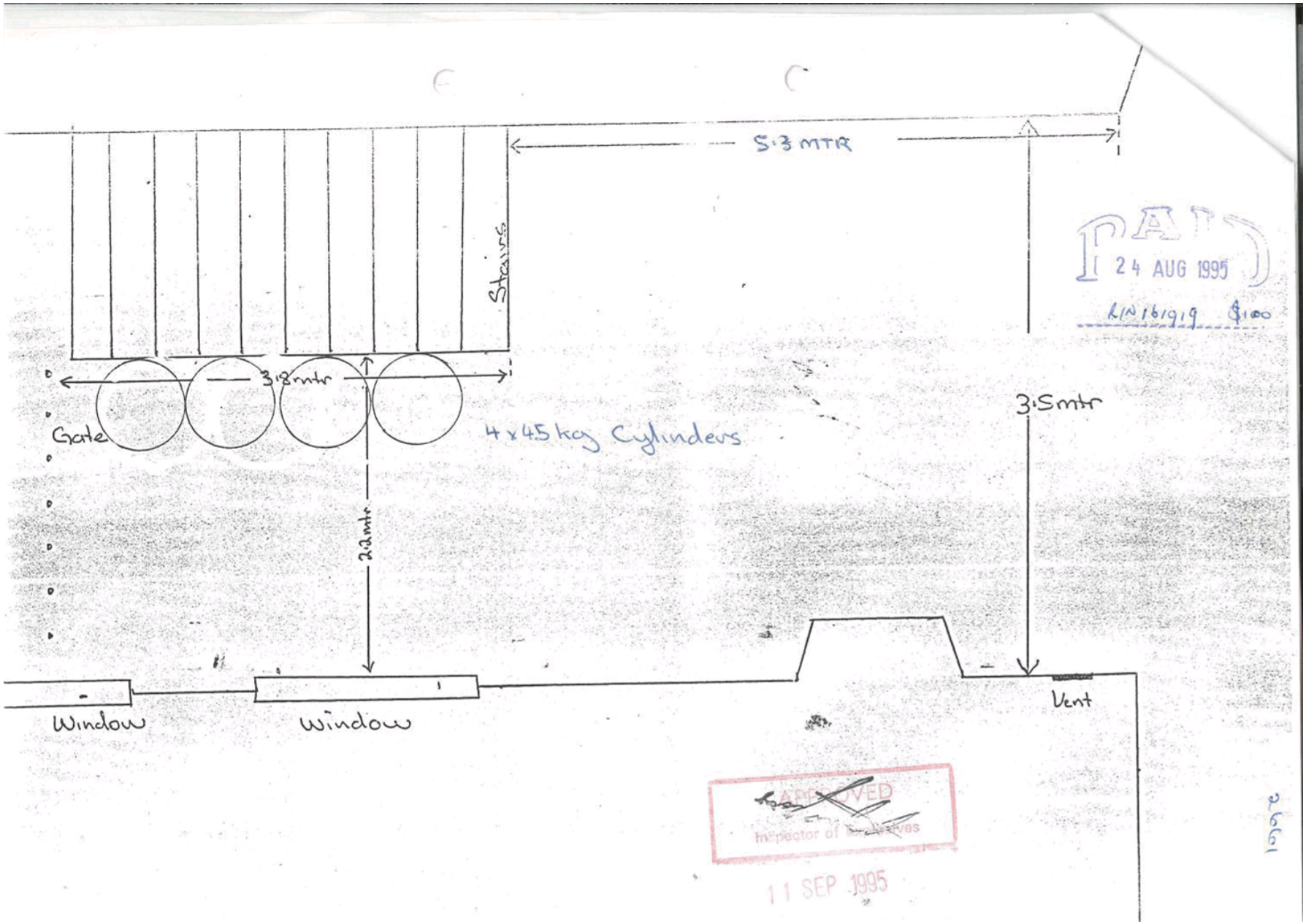
The above plans were checked, and the site inspected. The following is recommended:

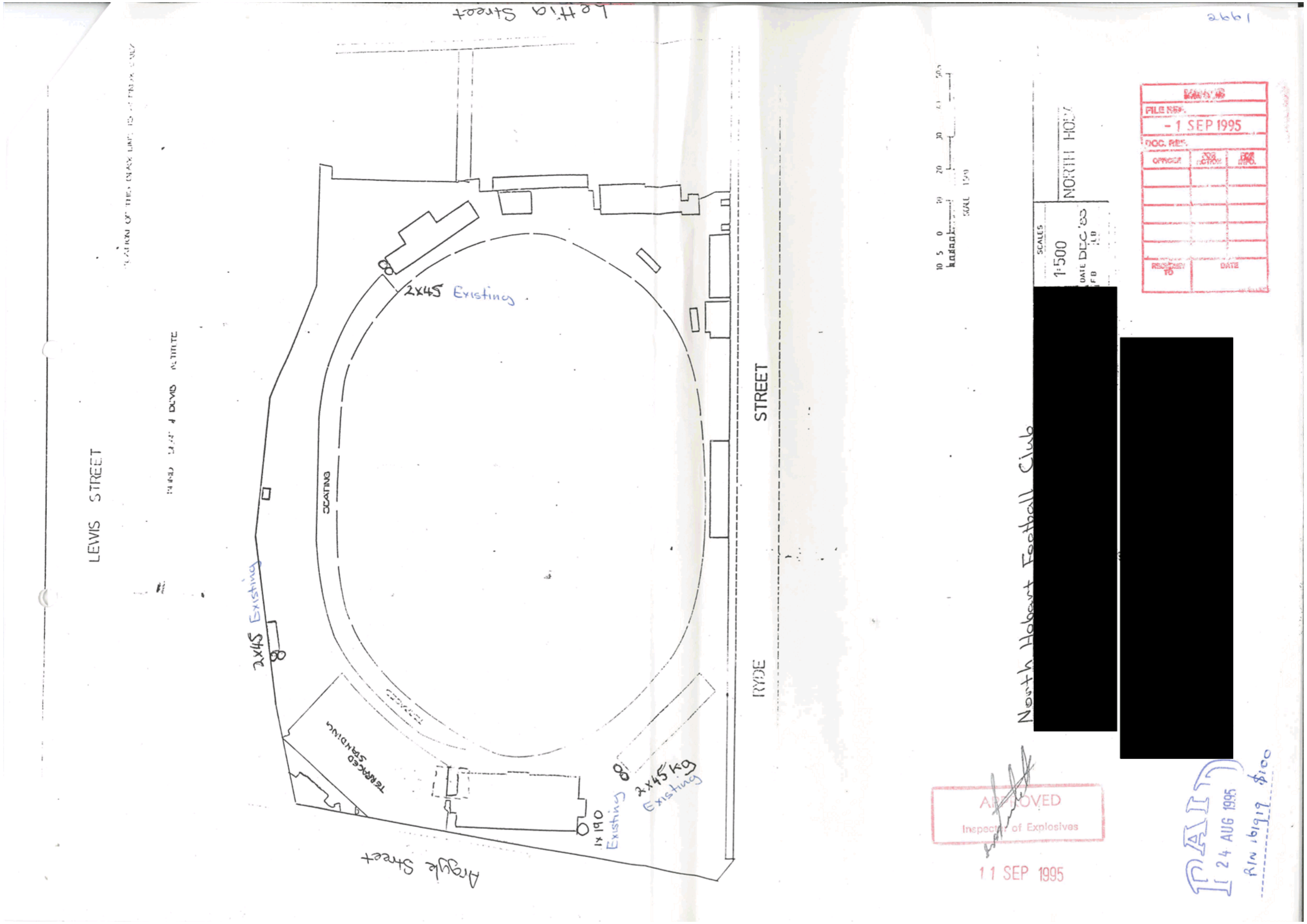
Remarks: SUBJECT TO 1. PLACARDING OF SITE.
2. ALL CYLINDERS TO BE ENCLOSED.

APPROVED

Inspector of Explosives: Date:

Senior Inspector of Explosives: Date:


5.3 MTR
Stairs
3.8mtr
Gate
4 x 45 kg Cylinders
3.5mtr
2.2mtr
Window
Window
Vent
PAID
24 AUG 1995
R/N 16/9/19 $100
APPROVED
Inspector of Explosives
11 SEP 1995


LEWIS STREET
RYDE STREET
Argyle Street
SEATING
TERRACED STANDING
2x45 Existing
2x45 Existing
2x45 kg Existing
1x190 Existing
North Hobart Football Club
[redacted]
NORTH HOB
SCALES 1:500
FILE REF.
-1 SEP 1995
DOC. REF.
APPROVED
Inspector of Explosives
11 SEP 1995
PAID
24 AUG 1995

Hobart City Council

Subject: RE: Potentially Contaminated Land Code - 1-5 Ryde Street, North Hobart

From: Salter, Simone - To: alex@enviromac.com.au - Date: 30 August 2018 at 8:38 AM, Attachments: image001.jpg image002.jpg

Hi Alex

Our records indicate the following:

1. An old brickworks site on the property adjacent to and identified the contaminant as a landfill. The address is 393 Argyle Street, North Hobart that has been identified with above, the operation was in place between 1816-1850s.
2. At 44 Ryde Street we have listed, but a note to delete from the register.

I hope this helps.

Thanks
Simone

Simone Salter | Senior Environmental Health Officer | Environmental Health
6238 2738

From: Alex Lovibond [mailto:alex@enviromac.com.au]
Sent: Tuesday, 28 August 2018 5:17 PM
To: Records Unit <RecordsUnit@hobartcity.com.au>
Cc: Simon Chislett <simonc@enviromac.com.au>
Subject: Potentially Contaminated Land Code - 1-5 Ryde Street, North Hobart

Good Afternoon HCC.

Att: Environmental Health Unit

EM&C have been engaged by *The North Hobart Football Club* to provide an Environmental Site Assessment to support their upcoming an application for development on potentially contaminated land.
Our client intends to construct a new building along the northern edge of the North Hobart Oval, and have identified to us that either the land intended for development, or the surrounding land may be classified as *potentially contaminated* based on the definition supplied within the HCC interim planning scheme.
The land intended for development is:
NORTH HOBART OVAL & BOWLS CLUB' - 1-5 RYDE ST NORTH HOBART TAS 7000
PID: 2003969
Title reference 119922/1

As the land has been identified by our client to us as potentially contaminated land, can you please disclose the activities carried out on the land in question, or in the instance where the potentially contaminating activity occurred on a neighbouring parcel of land, can you please give me the address/PIDs/title numbers along with the relevant activities carried out, such as the ones listed in table E2.2 within the planning scheme.

The reason I'm after this information is because the historical industries that have caused the land to become contaminated in the first place will impact the nature of our assessment, as it will guide us to what contaminants we should be testing for.

As I understand it, local councils have access to an overlay of potentially contaminated sites within the list, is it possible for me to access this overlay, or could you please provide me a screenshot of the local area with the potentially contaminating activities or affected areas of land highlighted?

Happy to have a chat with you further over the phone if you like,

Many thanks
Al

Alex Lovibond
Senior Environmental Scientist

Environmental Management & Consulting Pty Ltd
P. 03 6231 5979
M. 0439 306 677
E. alex@enviromac.com.au

Follow EM&C on LinkedIn
Follow me on LinkedIn

Tasmanian EPA

PROPERTY INFORMATION REQUEST FORM

To: Contaminated Sites Unit

Email: contaminatedsites@epa.tas.gov.au
Post: GPO Box 1550, HOBART TAS 7001

Minimum information required for a database search

Street number & name:	1-5 Ryde Street	Current Landowner :	Hobart City Council
Suburb / Town:	North Hobart	Current Site use:	Sporting Ground
Post code:	7000	Current Site operator:	North Hobart Football Club

Land title information (please specify Certificate of Title(s) and Property Identification number(s)):

Property ID: 2003969 Title Reference: 119922/1

Further information Potentially Contaminating Activities (PCA)

Current PCA on Site: Nil	Current PCA on surrounding land: Unknown
Past PCA on Site: Unknown	Past PCA on surrounding land: Brickworks (393 Argyle Street)
Names of Past operator (s) of Site: Unknown	Names of Past operator(s) of surrounding PCAs Unknown

Additional notes / comments

Identification of past PCA on surrounding land was communicated to EM&C over the phone by Hobart City Council. Awaiting confirmation in writing.

APPLICANT'S DETAILS		INVOICE DETAILS	
Company Name	Environmental Management & Consulting	**P.O or File reference**	EMC1866
Report recipient:	Alex Lovibond	**Invoice recipient:**	Environmental Management & Consulting
Email address:	alex@enviromac.com.au	Email address:	alex@enviromac.com.au
phone	03 6231 5979	Phone	03 6231 5979

Mailing address for report :

Payment The charge for this service is $237.00. An invoice will be sent on completion of the search.

N.B. Fee increases occur on 1 July every year.

Applicant's Signature.....

Date..29/8/18.....

Level 7, 134 Macquarie Street, Hobart TAS
GPO Box 1550, Hobart, TAS 7001 Australia

Enquiries: Contaminated Sites Unit
Phone: (03) 6165 4599
Email: contaminatedsites@epa.tas.gov.au
Web: www.epa.tas.gov.au
Our Ref: (EN-EM-AV-100706_38: H946191) sma

ENVIRONMENT PROTECTION AUTHORITY

21 September 2018

Mr Alex Lovibond
Environmental Management and Consulting
Level 2, 67 Letitia Street
NORTH HOBART TAS 7002

Dear Mr Lovibond

PROPERTY INFORMATION REQUEST
1-5 Ryde Street, North Hobart
PID 2003969

On 29 August 2018, the Contaminated Sites Unit received your Property Information Request relating to the land referred to above ('the Site'). A search of relevant databases and records has been undertaken.

No records relating to contamination or potentially contaminating activities on the Site were found.

EPA Tasmania received enquiries regarding redevelopment of 31 Federal Street (2016) and 393 Argyle Street (1998); Hobart City Council may have records relevant to your enquiry.

WorkSafe Tasmania [WST] records indicate that dangerous goods have been stored in underground storage tanks [UST] at several properties with 150m of the boundaries of the Site

• 27-29 Federal Street	1963-1985	WST File	K204
• 31 Federal Street	1972-1986	WST file	H631
• 37-41 Federal Street	1986	WST File	IS67155 vol 14
• 49a-53 Federal Street	1974-1977	WST File	S534
• 396 Argyle St (Unit 1&2)	1972-1984	WST File	R286

No other records relating to contamination or potentially contaminating activities at the Site or adjacent properties were found.

The search of records is restricted to those held by EPA Tasmania and includes records relating to: The *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010;* Industrial Sites (which are or have been regulated by EPA Tasmania); historical landfills; and contamination issues reported to the Contaminated Sites Unit. In addition, the Incidents and Complaints database and records relating to the historical storage of dangerous goods (as detailed below) are searched.

WorkSafe Tasmania (1300 366 322 or wstinfo@justice.tas.gov.au) may have issued dangerous goods licences and/or may hold relevant records for the Site and adjoining properties. As the storage of dangerous goods/fuels is an environmentally relevant activity, you may wish to contact them for further information.

Please note that the dangerous goods licensing records referred to by EPA Tasmania are for sites with underground storage tanks that ceased holding Dangerous Goods Licences prior to 1993. WorkSafe Tasmania hold the records for these Licences after 1993.

EPA Tasmania does not hold records on all sites that are or may be contaminated. You should consider obtaining a site history to determine the likelihood of contamination. If contamination on the Site or an adjacent property is considered likely, further assessment by a competent environmental assessment practitioner is recommended. Site assessments should be conducted in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, National Environment Protection Council (or as varied). http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/contaminated-site-assessment

Please note since 1 July 2015, the Director has required all environmental site assessments and reports submitted to the Contaminated Sites Unit for consideration to be prepared by a person certified as a specialist contaminated sites consultant under a scheme approved by the Director.
Effective 30 June 2018, the endorsed scheme is operated by Certified Environmental Practitioners (CEnvP): Consultants certified under this scheme are approved to use the seal **CEnvP Site Contamination**. https://www.cenvp.org.

Further details are available at http://epa.tas.gov.au/regulation/contaminated-sites/identification-and-assessment-of-contaminated-land/engaging-a-contaminated-site-assessment-consultant.

As local councils are able to issue Environment Protection Notices, Environmental Infringement Notices and record complaints, you may wish to contact them for additional information that may be relevant to the site. Further, if the Site has historically been subject to a permit under the *Land Use Planning and Approvals Act 1993*, the Council would have issued the permit.

Under the *Right to Information Act 2009* (RTI Act), you are entitled to apply for any records mentioned within this letter such as reports, letters, or other relevant documents. For further information on how the RTI process works and how to request information under the RTI Act please visit the Department of Primary Industries, Parks, Water and Environment website.

If you are purchasing a property, you should consider Part 5A of the *Environmental Management and Pollution Control Act 1994* (EMPCA) which defines and specifies requirements for managing contaminated sites. If there is reason to believe the site is, or is likely to be, contaminated there are certain requirements that you must meet (e.g. notification of a likely contaminated site to the Director, EPA as outlined in section 74B of the EMPCA).

Although all due care has been taken in the preparation of this letter, the Crown gives no warranty, express or implied, as to the accuracy or completeness of the information provided. The Crown and its servants or agents accept no responsibility for any loss or damage arising from reliance upon this letter, and any person relying on the letter does so at their own risk absolutely.

As you are aware, property searches incur a charge of $237.00. An invoice is enclosed.

If you have any queries in relation to the matters above, please contact the Contaminated Sites Unit using the details at the head of this correspondence or refer to the EPA website at www.epa.tas.gov.au and click on 'Regulation to locate information on Underground Fuel Tanks and Contaminated Sites.

Yours sincerely

Bruce Napier
ENVIRONMENTAL OFFICER - CONTAMINATED SITES

Email: alex@enviromac.com.au

Attachment: Invoice

APPENDIX C

Laboratory Certificates of Analysis

Chain of Custody and Analysis Request Page : 1 of 1

Site Name: North Hobart Oval	Client : Environmental Management and Consulting Pty Ltd	Primary Laboratory	Secondary Laboratory
Project Number: EMC1866	Quote Number: MEBQ/117/16	ALS Laboratory Group	Eurofins MGT
Sampled By: Alex Lovibond	Project Manager : Alex Lovibond	2-4 Westall Rd	2-5 Kingston Town Close
Phone : 0439 306 677	Phone : 0439 306 677	Springvale, VIC, 3171	Oakleigh, VIC, 3168
	INVOICES TO: admin@enviromac.com.au	Phone : 03) 85499600	Phone : 03) 9564 7055

em&c

RESULTS : Results Required By: Same day 24hrs 48hrs 3 days 5 days other: _____
Additional fee +100% +40% +20% +10%

Please ensure all samples are analysed within the same QC lot

Send Results & Copy of COC to:

Simon Chilsett	Alex Lovibond	Tom Latham
Email: simon@enviromac.con	Email: alex@enviromac.com.	Email: Tom@enviromac.com.au
Phone: 0428 288 258	Phone: 0439 306 677	Phone: 0488 515 991

Laboaratory Rinsate Water VOC, BATCH: EM1709310
Laboaratory Rinsate Water sVOC, BATCH: 5/07/18
Laboaratory Prepared Trip Blank, BATCH: EM1714628

Laboratory Sample ID	Field Sample ID	Date Collected	Sample Type		Preservation Method			Type & Number of Containers		Analyses Required									COMMENTS (Mention if samples are for QC/MS, Filtered or Not)
			Soil	Water	Ice	Acid	None	Glass	Plastic	S-26 TRH (C6-C40)/BTEXN /PAH plus 8 metals	P-20 Tasmanian EPA Bulletin No. 105 (Soil) excluding TBT	P-22 NEPM Screen for Soil Classification: e, CEC, pH(CaCl), T C, Clay Content	W-4 - TPH/TRH (C6-C36 or 40)/BTEXN plus F1 & F2	S-4 TPH/TRH (C6-C36 or 40)/BTEXN, F1,F2					
1	RB_7/9/18	7/09/18		X	X	X		5					X						ADDITIONAL SVOC BOTTLES PROVIDED FOR INTERNAL LAB QA/QC
2	TB_7/9/18	7/09/18	X		X			1						X					
3	QCP_7/9/18	7/09/18	X		X			1						X					
4	SB1_0.2-0.3	7/09/18	X		X			1			X								
5	SB1_0.5-0.6	7/09/18	X		X			1		X									PLEASE LOWER LOR FOR B(a)P ANALYSIS TO SUIT TAS EPA WASTE GUIDELINES FOR EACH OF THESE SAMPLES.
6	SB2_0.2-0.3	7/09/18	X		X			1		X									
7	SB3_0.4-0.5	10/09/18	X		X			1		X									PLEASE INCLUDE ALL OF THESE SAMPLES IN 1B105 COMPARISON TABLE
8	SB4_0.2-0.3	7/09/18	X		X			1		X									
9	SB5_0.3-0.4	7/09/18	X		X			1		X									
10	SB1_1.0-1.1	7/09/18	X		X			1				X							
11	SB2_0.5-0.6	7/09/18	X		X			1		X									
12	SB3_0.9-1.0	10/09/18	X		X			1		X									
13	SB4_1.3-1.4	7/09/18	X		X			1		X									
14	SB5_0.5-0.6	7/09/18	X		X			1		X									

FREIGHT

Environmental Division
Melbourne
Work Order Reference
EM1814532

Telephone : + 61-3-8549 9600

Relinquished By: ALEX LOVIBOND Date 10/9/18	Couriered By: Date:	Received By: Date: 11/9/18
Signature: Time: 16:00	Signature: Time	Signature: Time: 10:55

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM1814532**		
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Contact	: Customer Services EM
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: alex@enviromac.com.au	E-mail	: MelbourneEnviroSer@alsglobal.com
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Facsimile	: +61 03 6231 5979	Facsimile	: +61-3-8549 9626
Project	: EMC1866	Page	: 1 of 3
Order number	:	Quote number	: EB2017ENVMANCON0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: North Hobart Oval		
Sampler	: ALEX LOVIBOND		

Dates

Date Samples Received	: 11-Sep-2018 10:55	Issue Date	: 11-Sep-2018
Client Requested Due Date	: 18-Sep-2018	Scheduled Reporting Date	: **18-Sep-2018**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.0°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Issue Date	: 11-Sep-2018
Page	: 2 of 3
Work Order	: EM1814532 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP075-TAS Benzo(a)pyrene - Waste Classification (TAS	SOIL - P-20/1 TAS EPA 105 (no TBT)	SOIL - P-22 (Melb) minus PSD Soil Characterisation Suite (minus PSD)	SOIL - S-04 TRH/BTEXN	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1814532-002	07-Sep-2018 00:00	TB_7/9/18	✓				✓	
EM1814532-003	07-Sep-2018 00:00	QCP_7/9/18	✓				✓	
EM1814532-004	07-Sep-2018 00:00	SB1_0.2-0.3	✓		✓			
EM1814532-005	07-Sep-2018 00:00	SB1_0.5-0.6	✓	✓				✓
EM1814532-006	07-Sep-2018 00:00	SB2_0.2-0.3	✓	✓				✓
EM1814532-007	10-Sep-2018 00:00	SB3_0.4-0.5	✓	✓				✓
EM1814532-008	07-Sep-2018 00:00	SB4_0.2-0.3	✓	✓				✓
EM1814532-009	07-Sep-2018 00:00	SB5_0.3-0.4	✓	✓				✓
EM1814532-010	07-Sep-2018 00:00	SB1_1.0-1.1	✓			✓		
EM1814532-011	07-Sep-2018 00:00	SB2_0.5-0.6	✓					✓
EM1814532-012	10-Sep-2018 00:00	SB3_0.9-1.0	✓					✓
EM1814532-013	07-Sep-2018 00:00	SB4_1.3-1.4	✓					✓
EM1814532-014	07-Sep-2018 00:00	SB5_0.5-0.6	✓					✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-04 TRH/BTEXN
EM1814532-001	07-Sep-2018 00:00	RB_7/9/18	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Issue Date	: 11-Sep-2018
Page	: 3 of 3
Work Order	: EM1814532 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Requested Deliverables

ALEX LOVIBOND		
- *AU Certificate of Analysis - NATA (COA)	Email	alex@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	alex@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	alex@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	alex@enviromac.com.au
- EPA Waste Classification & Categorisation Guideline Report (COA_GL_EPA_WASTE)	Email	alex@enviromac.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	admin@enviromac.com.au
SIMON CHISLETT		
- *AU Certificate of Analysis - NATA (COA)	Email	simon@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	simon@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	simon@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	simon@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	simon@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	simon@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	simon@enviromac.com.au
- EPA Waste Classification & Categorisation Guideline Report (COA_GL_EPA_WASTE)	Email	simon@enviromac.com.au
TOM LATHAM		
- *AU Certificate of Analysis - NATA (COA)	Email	tom@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tom@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	tom@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	tom@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	tom@enviromac.com.au
- EPA Waste Classification & Categorisation Guideline Report (COA_GL_EPA_WASTE)	Email	tom@enviromac.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1814532**	Page	: 1 of 14
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Contact	: Customer Services EM
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Project	: EMC1866	Date Samples Received	: 11-Sep-2018 10:55
Order number	:	Date Analysis Commenced	: 11-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018 11:15
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Poor duplicate precision observed for sample EM1814532-004. Confirm sample heterogeneity via re-extraction and re-analysis
- pH analysis is done under non-stirring condition.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- (EP071): (EM1814515_004) Poor duplicate precision observed due to sample heterogeneity. Insufficient sample remains to confirm sample heterogeneity via re-extraction and re-analysis
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		<1.0	13.1	12.5	16.2	13.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	----	<5	<5	<5
Barium	7440-39-3	10	mg/kg		----	----	80	----	----
Beryllium	7440-41-7	1	mg/kg		----	----	<1	----	----
Cadmium	7440-43-9	1	mg/kg		----	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		----	----	7	11	6
Cobalt	7440-48-4	2	mg/kg		----	----	13	----	----
Copper	7440-50-8	5	mg/kg		----	----	73	31	82
Lead	7439-92-1	5	mg/kg		----	----	90	35	28
Manganese	7439-96-5	5	mg/kg		----	----	909	----	----
Molybdenum	7439-98-7	2	mg/kg		----	----	<2	----	----
Nickel	7440-02-0	2	mg/kg		----	----	13	18	15
Selenium	7782-49-2	5	mg/kg		----	----	<5	----	----
Silver	7440-22-4	2	mg/kg		----	----	<2	----	----
Tin	7440-31-5	5	mg/kg		----	----	25	----	----
Zinc	7440-66-6	5	mg/kg		----	----	112	27	57
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)									
Hexavalent Chromium	18540-29-9	0.5	mg/kg		----	----	<0.5	----	----
EK026SF: Total CN by Segmented Flow Analyser									
Total Cyanide	57-12-5	1	mg/kg		----	----	<1	----	----
EK040T: Fluoride Total									
Fluoride	16984-48-8	40	mg/kg		----	----	120	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	<0.05	----	----

Page : 4 of 14
Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Aldrin	309-00-2	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg		----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	<0.05	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	----	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	<0.5	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	----	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg		----	----	<2	----	----
^ Sum of Phenols	----	0.5	mg/kg		----	----	<0.5	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									

Page : 5 of 14
Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Naphthalene	91-20-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		----	----	2.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		----	----	0.7	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		----	----	4.9	<0.5	1.7
Pyrene	129-00-0	0.5	mg/kg		----	----	4.9	<0.5	1.8
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	----	2.3	<0.5	0.9
Chrysene	218-01-9	0.5	mg/kg		----	----	2.3	<0.5	0.8
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	----	2.8	<0.5	1.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	----	1.1	<0.5	0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	----	1.7	<0.5	0.8
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	----	2.0	<0.5	1.2
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	----	27.9	<0.5	10.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	----	3.5	<0.5	1.7
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	----	3.8	0.6	1.9
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	----	4.0	1.2	2.2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		----	----	2.97	0.08	2.21
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	280	210	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	280	210	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	330	280	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
			Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
				EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	330	280	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	77.5	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	84.9	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	86.7	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	92.1	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	89.6	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	76.2	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	99.3	97.6	90.3
Anthracene-d10	1719-06-8	0.5	%	----	----	107	100.0	99.4
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	103	95.2	95.6
EP075T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.025	%	----	----	119	101	95.3
Anthracene-d10	1719-06-8	0.025	%	----	----	116	98.2	93.8
4-Terphenyl-d14	1718-51-0	0.025	%	----	----	115	95.6	90.3
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	78.8	74.2	78.3	77.9	76.8

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TB_7/9/18	QCP_7/9/18	SB1_0.2-0.3	SB1_0.5-0.6	SB2_0.2-0.3
				Client sampling date / time	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-002	EM1814532-003	EM1814532-004	EM1814532-005	EM1814532-006
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	0.2	%		79.3	77.7	79.0	83.4	76.4
4-Bromofluorobenzene	460-00-4	0.2	%		90.9	88.5	89.8	93.0	87.6

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	SB3_0.4-0.5	SB4_0.2-0.3	SB5_0.3-0.4	SB1_1.0-1.1	SB2_0.5-0.6
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-007	EM1814532-008	EM1814532-009	EM1814532-010	EM1814532-011
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		----	----	----	6.4	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		8.7	5.8	10.8	13.8	14.2
ED006: Exchangeable Cations on Alkaline Soils									
ø Exchangeable Calcium	----	0.2	meq/100g		----	----	----	11.5	----
ø Exchangeable Magnesium	----	0.2	meq/100g		----	----	----	4.1	----
ø Exchangeable Potassium	----	0.2	meq/100g		----	----	----	0.8	----
ø Exchangeable Sodium	----	0.2	meq/100g		----	----	----	0.3	----
ø Cation Exchange Capacity	----	0.2	meq/100g		----	----	----	16.7	----
ø Exchangeable Calcium Percent	----	0.2	%		----	----	----	68.9	----
ø Exchangeable Magnesium Percent	----	0.2	%		----	----	----	24.6	----
ø Exchangeable Potassium Percent	----	0.2	%		----	----	----	4.7	----
ø Exchangeable Sodium Percent	----	0.2	%		----	----	----	1.7	----
ø Calcium/Magnesium Ratio	----	0.2	-		----	----	----	2.8	----
ø Magnesium/Potassium Ratio	----	0.2	-		----	----	----	5.2	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	----	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg		20	<2	7	----	13
Copper	7440-50-8	5	mg/kg		42	92	60	----	32
Iron	7439-89-6	0.005	%		----	----	----	3.86	----
Lead	7439-92-1	5	mg/kg		26	<5	49	----	28
Nickel	7440-02-0	2	mg/kg		16	9	12	----	12
Zinc	7440-66-6	5	mg/kg		49	32	79	----	60
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	----	1.7	----
Total Organic Carbon	----	0.5	%		----	----	----	1.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	0.6	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB3_0.4-0.5	SB4_0.2-0.3	SB5_0.3-0.4	SB1_1.0-1.1	SB2_0.5-0.6
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
Compound	CAS Number	LOR	Unit		EM1814532-007	EM1814532-008	EM1814532-009	EM1814532-010	EM1814532-011
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	1.4	----	0.8
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		0.7	<0.5	3.8	----	0.9
Pyrene	129-00-0	0.5	mg/kg		0.7	<0.5	4.1	----	0.8
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	1.6	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	1.4	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	3.1	----	0.7
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	1.1	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	----	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	2.0	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	2.9	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		1.4	<0.5	24.9	----	3.2
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	3.7	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	4.0	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	4.2	----	1.2
EP075B: Polynuclear Aromatic Hydrocarbons									
Benzo(a)pyrene	50-32-8	0.05	mg/kg		0.60	<0.05	2.72	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	140	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	140	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	<50

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL
(Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	SB3_0.4-0.5	SB4_0.2-0.3	SB5_0.3-0.4	SB1_1.0-1.1	SB2_0.5-0.6
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00
					EM1814532-007	EM1814532-008	EM1814532-009	EM1814532-010	EM1814532-011
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	<1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.1	85.0	92.3	----	86.0
Anthracene-d10	1719-06-8	0.5	%		96.6	95.3	93.0	----	81.1
4-Terphenyl-d14	1718-51-0	0.5	%		92.2	89.8	88.3	----	89.7
EP075T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.025	%		105	95.2	96.8	----	----
Anthracene-d10	1719-06-8	0.025	%		102	95.1	95.4	----	----
4-Terphenyl-d14	1718-51-0	0.025	%		97.9	92.8	90.2	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		77.2	76.1	71.8	----	76.5
Toluene-D8	2037-26-5	0.2	%		76.9	73.1	67.8	----	64.1
4-Bromofluorobenzene	460-00-4	0.2	%		89.9	91.4	83.0	----	62.5

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB3_0.9-1.0	SB4_1.3-1.4	SB5_0.5-0.6	----	----
			Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EM1814532-012	EM1814532-013	EM1814532-014	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	13.3	15.7	12.9	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	<5	<5	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	15	5	10	----	----
Copper	7440-50-8	5	mg/kg	90	12	73	----	----
Lead	7439-92-1	5	mg/kg	158	42	76	----	----
Nickel	7440-02-0	2	mg/kg	18	5	12	----	----
Zinc	7440-66-6	5	mg/kg	114	96	132	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	4.6	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	0.9	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	6.4	0.6	0.9	----	----
Pyrene	129-00-0	0.5	mg/kg	5.9	0.6	0.9	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	1.9	<0.5	0.6	----	----
Chrysene	218-01-9	0.5	mg/kg	1.7	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.4	0.6	0.8	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.1	<0.5	0.7	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.1	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.6	<0.5	0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	29.4	1.8	4.4	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	2.8	<0.5	0.8	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	3.0	0.6	1.1	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	3.2	1.2	1.4	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB3_0.9-1.0	SB4_1.3-1.4	SB5_0.5-0.6	----	----
				Client sampling date / time	10-Sep-2018 00:00	07-Sep-2018 00:00	07-Sep-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		EM1814532-012	EM1814532-013	EM1814532-014	---------	---------
					Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		120	<100	100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		120	<50	100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.0	88.4	94.8	----	----
Anthracene-d10	1719-06-8	0.5	%		95.9	97.8	96.0	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		92.6	94.4	90.5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		75.4	71.9	75.5	----	----
Toluene-D8	2037-26-5	0.2	%		70.2	71.1	70.6	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		87.8	84.8	85.2	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	RB_7/9/18	----	----	----	----
				Client sampling date / time	07-Sep-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1814532-001	--------	--------	--------	--------	
				Result	---	---	---	---	---
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----	
EP080: BTEXN									
Benzene	71-43-2	1	µg/L	<1	----	----	----	----	
Toluene	108-88-3	2	µg/L	<2	----	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----	
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----	
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%	90.0	----	----	----	----	
Toluene-D8	2037-26-5	2	%	78.5	----	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	97.7	----	----	----	----	

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	36	140
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	38	128
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	33	139
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP075T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	35	126
Anthracene-d10	1719-06-8	40	135
4-Terphenyl-d14	1718-51-0	42	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	129
Toluene-D8	2037-26-5	70	125
4-Bromofluorobenzene	460-00-4	71	129

ALS Environmental

Automated Guideline Comparison Report

EPA Tasmania Information Bulletin No. 105 - Table 2: Soil Hazard Categorisation

Work Order	: **EM1814532**	Page	: 1 of 14
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND		
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: alex@enviromac.com.au	E-mail	: MelbourneEnviroSer@alsglobal.com
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Facsimile	: +61 03 6231 5979	Facsimile	: +61-3-8549 9626
Project	: EMC1866	Date Received	: 11-Sep-2018 10:55
Order number	:	Date Analysed	: 11-Sep-2018
C-O-C number	: ----	Date Issued	: 17-Sep-2018 11:15
No. of samples received	: 14		
No. of samples analysed	: 14	Quote number	: EN/222

General Comments

This guideline comparison report **only** provides evaluation of total concentration data against upper limit thresholds for the 'Fill Material', 'Low Level Contaminated Soil', and 'Contaminated Soil' categories in Table 2 of EPA Tasmania Information Bulletin No. 105.

This guideline comparison report is **NOT** a soil classification report. Classification of soils requires consideration of a number of other factors including preliminary site investigation, sampling density and statistical calculations.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

This guideline comparison report only provides evaluation data where chemical parameters specifically listed within Table 2 of EPA Tasmania Information Bulletin No. 105 are analysed by ALS using the **P-20/1 package in full**. P-20/1 package does not include Tributyltin.

Red shading is applied where the result is equal to or greater than the guideline upper limit and/or equal to or lower than the guideline lower limit. Red shading is not applied to the 'Summary of Thresholds Reached or Exceeded'.

For the 'Summary of Thresholds Reached or Exceeded' to accurately function, all samples must be analysed and included in the 'Analytical Results' section of the following report. Please verify that all required IDs are listed and analysed.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Summary of Thresholds Reached or Exceeded

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Fill Material - Level 1

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
SB1_0.2-0.3	**EM1814532-004**	Manganese	EG005T	5	*< 500 mg/kg*	**909 mg/kg**
SB1_0.2-0.3	**EM1814532-004**	Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	*< 20 mg/kg*	**27.9 mg/kg**
SB1_0.2-0.3	**EM1814532-004**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**2.97 mg/kg**
SB1_0.5-0.6	**EM1814532-005**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**0.08 mg/kg**
SB2_0.2-0.3	**EM1814532-006**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**2.21 mg/kg**
SB3_0.4-0.5	**EM1814532-007**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**0.60 mg/kg**
SB5_0.3-0.4	**EM1814532-009**	Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	*< 20 mg/kg*	**24.9 mg/kg**
SB5_0.3-0.4	**EM1814532-009**	Benzo(a)pyrene	EP075-TAS	0.05	*< 0.08 mg/kg*	**2.72 mg/kg**

TAS EPA Bulletin No. 105 (2012)

Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Client Sample ID	ALS Sample ID	Compound	Method	LOR	Limits	Result
SB1_0.2-0.3	**EM1814532-004**	Benzo(a)pyrene	EP075-TAS	0.05	*< 2 mg/kg*	**2.97 mg/kg**
SB2_0.2-0.3	**EM1814532-006**	Benzo(a)pyrene	EP075-TAS	0.05	*< 2 mg/kg*	**2.21 mg/kg**
SB5_0.3-0.4	**EM1814532-009**	Benzo(a)pyrene	EP075-TAS	0.05	*< 2 mg/kg*	**2.72 mg/kg**

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	SB1_0.2-0.3 07-Sep-2018 15:00 EM1814532-004	SB1_0.5-0.6 07-Sep-2018 15:00 EM1814532-005	SB2_0.2-0.3 07-Sep-2018 15:00 EM1814532-006	SB3_0.4-0.5 10-Sep-2018 15:00 EM1814532-007	SB4_0.2-0.3 07-Sep-2018 15:00 EM1814532-008
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	mg/kg	----	750	<5	<5	<5	<5	<5
Barium	EG005T	10	mg/kg	----	30000	**80**	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	400	<1	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	400	<1	<1	<1	<1	<1
Chromium	EG005T	2	mg/kg	----	5000	**7**	**11**	**6**	**20**	<2
Cobalt	EG005T	2	mg/kg	----	1000	**13**	----	----	----	----
Copper	EG005T	5	mg/kg	----	7500	**73**	**31**	**82**	**42**	**92**
Lead	EG005T	5	mg/kg	----	3000	**90**	**35**	**28**	**26**	<5
Manganese	EG005T	5	mg/kg	----	25000	**909**	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	4000	<2	----	----	----	----
Nickel	EG005T	2	mg/kg	----	3000	**13**	**18**	**15**	**16**	**9**
Selenium	EG005T	5	mg/kg	----	200	<5	----	----	----	----
Silver	EG005T	2	mg/kg	----	720	<2	----	----	----	----
Tin	EG005T	5	mg/kg	----	900	**25**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	50000	**112**	**27**	**57**	**49**	**32**
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	110	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	2000	<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	2500	<1	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	10000	**120**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	50	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	50	<0.05	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	1000	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	2000	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	200	**27.9**	<0.5	**10.5**	**1.4**	<0.5

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Work Order	: EM1814532
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	Guideline Lower Limit	Guideline Upper Limit	**SB1_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-004**	**SB1_0.5-0.6** 07-Sep-2018 15:00 **EM1814532-005**	**SB2_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-006**	**SB3_0.4-0.5** 10-Sep-2018 15:00 **EM1814532-007**	**SB4_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-008**
EP075B: Polynuclear Aromatic Hydrocarbons										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	20	**2.97**	**0.08**	**2.21**	**0.60**	<0.05
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	1000	<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	10000	**210**	<50	<50	<50	<50
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	50	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	1000	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	1080	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	1800	<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	Client sample ID / Sampling date/time	SB1_0.2-0.3 07-Sep-2018 15:00	SB1_0.5-0.6 07-Sep-2018 15:00	SB2_0.2-0.3 07-Sep-2018 15:00	SB3_0.4-0.5 10-Sep-2018 15:00	SB4_0.2-0.3 07-Sep-2018 15:00
							EM1814532-004	EM1814532-005	EM1814532-006	EM1814532-007	EM1814532-008
EG005T: Total Metals by ICP-AES											
Arsenic	EG005T	5	mg/kg	----	20		<5	<5	<5	<5	<5
Barium	EG005T	10	mg/kg	----	300		**80**	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	2		<1	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	3		<1	<1	<1	<1	<1
Chromium	EG005T	2	mg/kg	----	50		**7**	**11**	**6**	**20**	<2
Cobalt	EG005T	2	mg/kg	----	100		**13**	----	----	----	----
Copper	EG005T	5	mg/kg	----	100		**73**	**31**	**82**	**42**	**92**
Lead	EG005T	5	mg/kg	----	300		**90**	**35**	**28**	**26**	<5
Manganese	EG005T	5	mg/kg	----	500		**909**	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	10		<2	----	----	----	----
Nickel	EG005T	2	mg/kg	----	60		**13**	**18**	**15**	**16**	**9**
Selenium	EG005T	5	mg/kg	----	10		<5	----	----	----	----
Silver	EG005T	2	mg/kg	----	10		<2	----	----	----	----
Tin	EG005T	5	mg/kg	----	50		**25**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	200		**112**	**27**	**57**	**49**	**32**
EG035T: Total Recoverable Mercury by FIMS											
Mercury	EG035T	0.1	mg/kg	----	1		<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)											
Hexavalent Chromium	EG048G	0.5	mg/kg	----	1		<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser											
Total Cyanide	EK026SF	1	mg/kg	----	32		<1	----	----	----	----
EK040T: Fluoride Total											
Fluoride	EK040T	40	mg/kg	----	300		**120**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)											
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	2		<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)											
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	2		<0.05	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	2		<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds											
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	25		<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons											
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	20		**27.9**	<0.5	**10.5**	**1.4**	<0.5
EP075B: Polynuclear Aromatic Hydrocarbons											

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	Client sample ID / Sampling date/time	SB1_0.2-0.3 07-Sep-2018 15:00	SB1_0.5-0.6 07-Sep-2018 15:00	SB2_0.2-0.3 07-Sep-2018 15:00	SB3_0.4-0.5 10-Sep-2018 15:00	SB4_0.2-0.3 07-Sep-2018 15:00
							EM1814532-004	EM1814532-005	EM1814532-006	EM1814532-007	EM1814532-008
EP075B: Polynuclear Aromatic Hydrocarbons - Continued											
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	0.08		**2.97**	**0.08**	**2.21**	**0.60**	<0.05
EP080/071: Total Petroleum Hydrocarbons											
C6 - C9 Fraction	EP080	10	mg/kg	----	65		<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	1000		**210**	<50	<50	<50	<50
EP080: BTEXN											
Benzene	EP080	0.2	mg/kg	----	1		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	1		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	3		<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	14		<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	Method	LOR	Unit	Guideline Lower Limit	Guideline Upper Limit	SB1_0.2-0.3 07-Sep-2018 15:00 EM1814532-004	SB1_0.5-0.6 07-Sep-2018 15:00 EM1814532-005	SB2_0.2-0.3 07-Sep-2018 15:00 EM1814532-006	SB3_0.4-0.5 10-Sep-2018 15:00 EM1814532-007	SB4_0.2-0.3 07-Sep-2018 15:00 EM1814532-008
EG005T: Total Metals by ICP-AES										
Arsenic	EG005T	5	mg/kg	----	200	<5	<5	<5	<5	<5
Barium	EG005T	10	mg/kg	----	3000	**80**	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	40	<1	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	40	<1	<1	<1	<1	<1
Chromium	EG005T	2	mg/kg	----	500	**7**	**11**	**6**	**20**	<2
Cobalt	EG005T	2	mg/kg	----	200	**13**	----	----	----	----
Copper	EG005T	5	mg/kg	----	2000	**73**	**31**	**82**	**42**	**92**
Lead	EG005T	5	mg/kg	----	1200	**90**	**35**	**28**	**26**	<5
Manganese	EG005T	5	mg/kg	----	5000	**909**	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	1000	<2	----	----	----	----
Nickel	EG005T	2	mg/kg	----	600	**13**	**18**	**15**	**16**	**9**
Selenium	EG005T	5	mg/kg	----	50	<5	----	----	----	----
Silver	EG005T	2	mg/kg	----	180	<2	----	----	----	----
Tin	EG005T	5	mg/kg	----	500	**25**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	14000	**112**	**27**	**57**	**49**	**32**
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	30	<0.1	<0.1	<0.1	<0.1	<0.1
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	200	<0.5	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	1000	<1	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	3000	**120**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	20	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	20	<0.05	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	200	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	500	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	40	**27.9**	<0.5	**10.5**	**1.4**	<0.5
EP075B: Polynuclear Aromatic Hydrocarbons										

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time* / Guideline Lower Limit	Guideline Upper Limit	**SB1_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-004**	**SB1_0.5-0.6** 07-Sep-2018 15:00 **EM1814532-005**	**SB2_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-006**	**SB3_0.4-0.5** 10-Sep-2018 15:00 **EM1814532-007**	**SB4_0.2-0.3** 07-Sep-2018 15:00 **EM1814532-008**
EP075B: Polynuclear Aromatic Hydrocarbons - Continued										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	2	**2.97**	**0.08**	**2.21**	**0.60**	<0.05
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	650	<10	<10	<10	<10	<10
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	5000	**210**	<50	<50	<50	<50
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	5	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	EP080	0.5	mg/kg	----	100	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	EP080	0.5	mg/kg	----	100	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	EP080	0.5	mg/kg	----	180	<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

				Client sample ID	Guideline	Guideline	**SB5_0.3-0.4**	----	----	----	----
				Sampling date/time			07-Sep-2018 15:00	----	----	----	----
Compound	*Method*	*LOR*	*Unit*		Lower Limit	Upper Limit	EM1814532-009	--------	--------	--------	--------
EG005T: Total Metals by ICP-AES											
Barium	EG005T	10	mg/kg	----	----	----	----	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	----	----	----	----	----	----	----
Cobalt	EG005T	2	mg/kg	----	----	----	----	----	----	----	----
Manganese	EG005T	5	mg/kg	----	----	----	----	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	----	----	----	----	----	----	----
Selenium	EG005T	5	mg/kg	----	----	----	----	----	----	----	----
Silver	EG005T	2	mg/kg	----	----	----	----	----	----	----	----
Tin	EG005T	5	mg/kg	----	----	----	----	----	----	----	----
Arsenic	EG005T	5	mg/kg	----	750	<5	----	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	400	<1	----	----	----	----	----
Chromium	EG005T	2	mg/kg	----	5000	**7**	----	----	----	----	----
Copper	EG005T	5	mg/kg	----	7500	**60**	----	----	----	----	----
Lead	EG005T	5	mg/kg	----	3000	**49**	----	----	----	----	----
Nickel	EG005T	2	mg/kg	----	3000	**12**	----	----	----	----	----
Zinc	EG005T	5	mg/kg	----	50000	**79**	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS											
Mercury	EG035T	0.1	mg/kg	----	110	<0.1	----	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)											
Hexavalent Chromium	EG048G	0.5	mg/kg	----	----	----	----	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser											
Total Cyanide	EK026SF	1	mg/kg	----	----	----	----	----	----	----	----
EK040T: Fluoride Total											
Fluoride	EK040T	40	mg/kg	----	----	----	----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)											
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	----	----	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)											
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	----	----	----	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	----	----	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds											
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	----	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons											
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	200	**24.9**	----	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons											

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Work Order	: EM1814532
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

Classification and Management of Contaminated Soil for Disposal

Table 2 Maximum total conc. - Contaminated Soil: Table 2: Maximum Total Concentration: Contaminated Soil - Level 3

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time*	Guideline Lower Limit	Guideline Upper Limit	**SB5_0.3-0.4** 07-Sep-2018 15:00 EM1814532-009	---- ---- --------	---- ---- --------	---- ---- --------	---- ---- --------
EP075B: Polynuclear Aromatic Hydrocarbons - Continued											
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg		----	20	**2.72**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons											
C6 - C9 Fraction	EP080	10	mg/kg		----	1000	<10	----	----	----	----
C10 - C36 Fraction (sum)	EP071	50	mg/kg		----	10000	<50	----	----	----	----
EP080: BTEXN											
Benzene	EP080	0.2	mg/kg		----	50	<0.2	----	----	----	----
Toluene	EP080	0.5	mg/kg		----	1000	<0.5	----	----	----	----
Ethylbenzene	EP080	0.5	mg/kg		----	1080	<0.5	----	----	----	----
Total Xylenes	EP080	0.5	mg/kg		----	1800	<0.5	----	----	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

				Client sample ID	Guideline	Guideline	SB5_0.3-0.4	----	----	----	----
				Sampling date/time			07-Sep-2018 15:00	----	----	----	----
Compound	*Method*	*LOR*	*Unit*		Lower Limit	Upper Limit	EM1814532-009	--------	--------	--------	--------
EG005T: Total Metals by ICP-AES											
Barium	EG005T	10	mg/kg	----	----	----	----	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	----	----	----	----	----	----	----
Cobalt	EG005T	2	mg/kg	----	----	----	----	----	----	----	----
Manganese	EG005T	5	mg/kg	----	----	----	----	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	----	----	----	----	----	----	----
Selenium	EG005T	5	mg/kg	----	----	----	----	----	----	----	----
Silver	EG005T	2	mg/kg	----	----	----	----	----	----	----	----
Tin	EG005T	5	mg/kg	----	----	----	----	----	----	----	----
Arsenic	EG005T	5	mg/kg	----	20	<5	----	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	3	<1	----	----	----	----	----
Chromium	EG005T	2	mg/kg	----	50	**7**	----	----	----	----	----
Copper	EG005T	5	mg/kg	----	100	**60**	----	----	----	----	----
Lead	EG005T	5	mg/kg	----	300	**49**	----	----	----	----	----
Nickel	EG005T	2	mg/kg	----	60	**12**	----	----	----	----	----
Zinc	EG005T	5	mg/kg	----	200	**79**	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS											
Mercury	EG035T	0.1	mg/kg	----	1	<0.1	----	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)											
Hexavalent Chromium	EG048G	0.5	mg/kg	----	----	----	----	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser											
Total Cyanide	EK026SF	1	mg/kg	----	----	----	----	----	----	----	----
EK040T: Fluoride Total											
Fluoride	EK040T	40	mg/kg	----	----	----	----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)											
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	----	----	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)											
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	----	----	----	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	----	----	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds											
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	----	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons											
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	20	**24.9**	----	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons											

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Fill Material: Table 2: Maximum Total Concentration: Fill Material - Level 1

Sub-Matrix: **SOIL**

				Client sample ID	Guideline	Guideline	**SB5_0.3-0.4**	----	----	----	----
				Sampling date/time			07-Sep-2018 15:00	----	----	----	----
Compound	*Method*	*LOR*	*Unit*		Lower Limit	Upper Limit	**EM1814532-009**	--------	--------	--------	--------
EP075B: Polynuclear Aromatic Hydrocarbons - Continued											
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg		----	0.08	**2.72**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons											
C6 - C9 Fraction	EP080	10	mg/kg		----	65	<10	----	----	----	----
C10 - C36 Fraction (sum)	EP071	50	mg/kg		----	1000	<50	----	----	----	----
EP080: BTEXN											
Benzene	EP080	0.2	mg/kg		----	1	<0.2	----	----	----	----
Toluene	EP080	0.5	mg/kg		----	1	<0.5	----	----	----	----
Ethylbenzene	EP080	0.5	mg/kg		----	3	<0.5	----	----	----	----
Total Xylenes	EP080	0.5	mg/kg		----	14	<0.5	----	----	----	----

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time* / Guideline Lower Limit	Guideline Upper Limit	**SB5_0.3-0.4** / 07-Sep-2018 15:00 / **EM1814532-009**	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------
EG005T: Total Metals by ICP-AES										
Barium	EG005T	10	mg/kg	----	----	----	----	----	----	----
Beryllium	EG005T	1	mg/kg	----	----	----	----	----	----	----
Cobalt	EG005T	2	mg/kg	----	----	----	----	----	----	----
Manganese	EG005T	5	mg/kg	----	----	----	----	----	----	----
Molybdenum	EG005T	2	mg/kg	----	----	----	----	----	----	----
Selenium	EG005T	5	mg/kg	----	----	----	----	----	----	----
Silver	EG005T	2	mg/kg	----	----	----	----	----	----	----
Tin	EG005T	5	mg/kg	----	----	----	----	----	----	----
Arsenic	EG005T	5	mg/kg	----	200	<5	----	----	----	----
Cadmium	EG005T	1	mg/kg	----	40	<1	----	----	----	----
Chromium	EG005T	2	mg/kg	----	500	**7**	----	----	----	----
Copper	EG005T	5	mg/kg	----	2000	**60**	----	----	----	----
Lead	EG005T	5	mg/kg	----	1200	**49**	----	----	----	----
Nickel	EG005T	2	mg/kg	----	600	**12**	----	----	----	----
Zinc	EG005T	5	mg/kg	----	14000	**79**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS										
Mercury	EG035T	0.1	mg/kg	----	30	<0.1	----	----	----	----
EG048: Hexavalent Chromium (Alkaline Digest)										
Hexavalent Chromium	EG048G	0.5	mg/kg	----	----	----	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser										
Total Cyanide	EK026SF	1	mg/kg	----	----	----	----	----	----	----
EK040T: Fluoride Total										
Fluoride	EK040T	40	mg/kg	----	----	----	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)										
Total Polychlorinated biphenyls	EP066	0.1	mg/kg	----	----	----	----	----	----	----
EP068A: Organochlorine Pesticides (OC)										
Sum of Aldrin + Dieldrin	EP068	0.05	mg/kg	----	----	----	----	----	----	----
Sum of DDD + DDE + DDT	EP068	0.05	mg/kg	----	----	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds										
Sum of Phenols	EP075(SIM)	0.5	mg/kg	----	----	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons										
Sum of polycyclic aromatic hydrocarbons	EP075(SIM)	0.5	mg/kg	----	40	**24.9**	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons										

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Classification and Management of Contaminated Soil for Disposal
Table 2 Maximum total conc. - Low Level Contaminated Soil: Table 2: Maximum Total Concentration: Low Level Contaminated Soil - Level 2

Sub-Matrix: **SOIL**

Compound	*Method*	*LOR*	*Unit*	*Client sample ID* / *Sampling date/time* / Guideline Lower Limit	Guideline Upper Limit	**SB5_0.3-0.4** / 07-Sep-2018 15:00 / **EM1814532-009**	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------	---- / ---- / --------
EP075B: Polynuclear Aromatic Hydrocarbons - Continued										
Benzo(a)pyrene	EP075-TAS	0.05	mg/kg	----	2	**2.72**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	EP080	10	mg/kg	----	650	<10	----	----	----	----
C10 - C36 Fraction (sum)	EP071	50	mg/kg	----	5000	<50	----	----	----	----
EP080: BTEXN										
Benzene	EP080	0.2	mg/kg	----	5	<0.2	----	----	----	----
Toluene	EP080	0.5	mg/kg	----	100	<0.5	----	----	----	----
Ethylbenzene	EP080	0.5	mg/kg	----	100	<0.5	----	----	----	----
Total Xylenes	EP080	0.5	mg/kg	----	180	<0.5	----	----	----	----

Note: Red shading is applied where the result is equal to or greater than the guideline upper limit and/or equal to or lower than the guideline lower limit.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1814532**	Page	: 1 of 19
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Contact	: Customer Services EM
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 0408 391 738	Telephone	: +61-3-8549 9600
Project	: EMC1866	Date Samples Received	: 11-Sep-2018
Order number	:	Date Analysis Commenced	: 11-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 14		
No. of samples analysed	: 14		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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Work Order	:	EM1814532
Client	:	ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	:	EMC1866

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 1926985)									
EM1814408-005	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.7	6.7	0.00	0% - 20%
EM1814468-002	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	6.0	6.1	1.65	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1925357)									
EM1814524-006	Anonymous	EA055: Moisture Content	----	0.1	%	37.7	38.2	1.15	0% - 20%
EM1814532-010	SB1_1.0-1.1	EA055: Moisture Content	----	0.1	%	13.8	14.3	3.80	0% - 50%
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1925829)									
EM1814532-010	SB1_1.0-1.1	ED006: Calcium/Magnesium Ratio	----	0.1	-	2.8	2.9	0.00	0% - 50%
		ED006: Magnesium/Potassium Ratio	----	0.1	-	5.2	5.2	0.00	0% - 20%
		ED006: Exchangeable Calcium Percent	----	0.2	%	68.9	69.5	0.887	0% - 20%
		ED006: Exchangeable Magnesium Percent	----	0.2	%	24.6	24.2	1.51	0% - 20%
		ED006: Exchangeable Potassium Percent	----	0.2	%	4.7	4.6	2.21	0% - 20%
		ED006: Exchangeable Sodium Percent	----	0.2	%	1.7	1.6	8.50	No Limit
		ED006: Exchangeable Calcium	----	0.2	meq/100g	11.5	12.3	6.46	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	4.1	4.3	4.07	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	0.8	0.8	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	0.3	0.3	0.00	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	16.7	17.7	5.57	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1926466)									
EM1814513-001	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	140	150	8.94	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	221	252	13.0	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	16	15	0.00	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1926466) - continued									
EM1814513-001	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	48	47	2.45	0% - 20%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	10	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	52	48	6.67	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	145	144	0.00	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	454	430	5.45	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	523	539	3.05	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	440	381	14.4	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	65700	64800	1.36	0% - 20%
EM1814520-018	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	80	80	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	16	22.0	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	5	5	0.00	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	9	25.2	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	16	14.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	20	5.32	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	168	179	6.42	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	49	49	0.00	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	13500	14700	8.44	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1926468)									
EM1814532-009	SB5_0.3-0.4	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	60	60	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.00	No Limit
		EG005T: Cobalt	7440-48-4	2	mg/kg	10	12	13.7	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	11	0.00	No Limit
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	60	66	9.37	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	49	63	26.2	0% - 50%
		EG005T: Manganese	7439-96-5	5	mg/kg	285	294	3.19	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1926468) - continued									
EM1814532-009	SB5_0.3-0.4	EG005T: Tin	7440-31-5	5	mg/kg	14	11	30.3	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	79	66	18.3	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	25300	26900	6.24	0% - 20%
EM1814545-002	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	120	150	26.4	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	69	60	15.1	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	8	7	19.4	No Limit
		EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	27	17	43.9	0% - 50%
		EG005T: Silver	7440-22-4	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	105	94	11.5	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	15	12	18.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	52	45	14.2	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Tin	7440-31-5	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	29	17.8	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	46800	43300	7.59	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1926467)									
EM1814513-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.5	0.6	0.00	No Limit
EM1814520-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1926469)									
EM1814532-009	SB5_0.3-0.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1814545-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG048: Hexavalent Chromium (Alkaline Digest) (QC Lot: 1926683)									
EM1814452-012	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EM1814520-007	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EK026SF: Total CN by Segmented Flow Analyser (QC Lot: 1927459)									
EM1814452-015	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.00	No Limit
EM1814454-004	Anonymous	EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.00	No Limit
EK040T: Fluoride Total (QC Lot: 1926668)									
EM1814532-004	SB1_0.2-0.3	EK040T: Fluoride	16984-48-8	40	mg/kg	120	140	14.8	No Limit
EM1814565-006	Anonymous	EK040T: Fluoride	16984-48-8	40	mg/kg	220	180	19.6	No Limit
EP004: Organic Matter (QC Lot: 1927539)									
EM1814411-039	Anonymous	EP004: Organic Matter	----	0.5	%	<0.5	<0.5	0.00	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1926516)									
EM1814401-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1926518)									
EM1814401-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1926503)									
EM1814532-005	SB1_0.5-0.6	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1926515)									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)A: Phenolic Compounds (QC Lot: 1926515) - continued									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EM1814401-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1926503)									
EM1814532-005	SB1_0.5-0.6	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1926515)									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.6	23.9	No Limit

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				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1926515) - continued									
EM1814532-004	SB1_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.5	2.0	23.1	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	<0.5	28.4	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	4.9	4.4	9.41	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	4.9	4.5	7.91	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	2.3	2.4	5.97	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	2.3	2.2	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.8	3.1	9.83	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.1	1.1	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.7	2.8	5.60	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.7	1.8	7.43	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.0	2.2	6.09	No Limit
EM1814401-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1928641)									
EM1814532-004	SB1_0.2-0.3	EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	2.97	# 2.23	28.3	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1925188)									
EM1814532-003	QCP_7/9/18	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1814532-013	SB4_1.3-1.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926502)									
EM1814532-014	SB5_0.5-0.6	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926502) - continued									
EM1814532-014	SB5_0.5-0.6	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1814532-005	SB1_0.5-0.6	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926517)									
EM1814532-004	SB1_0.2-0.3	EP071: C15 - C28 Fraction	----	100	mg/kg	210	150	31.1	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	210	150	33.3	No Limit
EM1814401-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1925188)									
EM1814532-003	QCP_7/9/18	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1814532-013	SB4_1.3-1.4	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1926502)									
EM1814532-014	SB5_0.5-0.6	EP071: >C16 - C34 Fraction	----	100	mg/kg	100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	100	<50	66.7	No Limit
EM1814532-005	SB1_0.5-0.6	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1926517)									
EM1814532-004	SB1_0.2-0.3	EP071: >C16 - C34 Fraction	----	100	mg/kg	280	220	21.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	280	220	24.0	No Limit
EM1814401-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1925188)									
EM1814532-003	QCP_7/9/18	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 1925188) - continued									
EM1814532-003	QCP_7/9/18	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1814532-013	SB4_1.3-1.4	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1925179)									
EM1814515-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	960	580	50.3	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	250	80	98.6	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	600	# 210	95.4	0% - 50%
EM1814518-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1926039)									
EM1814473-041	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EM1814473-044	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1925179)									
EM1814515-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	300	100	95.2	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	1390	# 740	61.0	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	µg/L	360	100	113	No Limit
EM1814518-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1926039)									
EM1814473-041	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EM1814473-044	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 1926039)									
EM1814473-041	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	16	14	16.7	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 1926039) - continued									
EM1814473-041	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EM1814473-044	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

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Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 1925829)								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	33 meq/100g	91.1	75	120
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	32 meq/100g	82.3	75	120
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	2.2 meq/100g	98.6	75	120
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	5.6 meq/100g	91.7	75	120
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Calcium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Magnesium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Potassium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	----	----	----	----
ED006: Calcium/Magnesium Ratio	----	0.1	-	<0.1	----	----	----	----
ED006: Magnesium/Potassium Ratio	----	0.1	-	<0.1	----	----	----	----
EG005T: Total Metals by ICP-AES (QCLot: 1926466)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	94.2	78	107
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	104	76	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	101	84	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.7	76	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	96.5	78	110
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	96.8	78	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.7	78	108
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	90.2	84	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	91.3	78	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	98.8	81	110
EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	7.9 mg/kg	92.0	78	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	80	109
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	92	110
EG005T: Silver	7440-22-4	2	mg/kg	<2	2.1 mg/kg	85.1	80	108
EG005T: Tin	7440-31-5	5	mg/kg	<5	5.2 mg/kg	99.8	78	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.1	79	110
EG005T: Total Metals by ICP-AES (QCLot: 1926468)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	93.4	78	107
EG005T: Barium	7440-39-3	10	mg/kg	<10	143 mg/kg	106	76	110
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	5.63 mg/kg	102	84	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.3	76	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	97.5	78	110

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1926468) - continued								
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	16 mg/kg	97.2	78	112
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.2	78	108
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	92.0	84	112
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	92.1	78	106
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	99.9	81	110
EG005T: Molybdenum	7439-98-7	2	mg/kg	<2	7.9 mg/kg	87.6	78	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	80	109
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	101	92	110
EG005T: Silver	7440-22-4	2	mg/kg	<2	2.1 mg/kg	85.7	80	108
EG005T: Tin	7440-31-5	5	mg/kg	<5	5.2 mg/kg	90.0	78	117
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.9	79	110
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926467)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	78.2	77	104
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926469)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	78.6	77	104
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 1926683)								
EG048G: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	40 mg/kg	79.0	75	112
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 1927459)								
EK026SF: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	92.4	80	107
EK040T: Fluoride Total (QCLot: 1926668)								
EK040T: Fluoride	16984-48-8	40	mg/kg	<40	400 mg/kg	88.2	75	110
EP004: Organic Matter (QCLot: 1927539)								
EP004: Organic Matter	----	0.5	%	<0.5	77 %	98.0	71	109
EP004: Total Organic Carbon	----	0.5	%	<0.5	43.5 %	101	73	111
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1926516)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	89.3	63	115
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	65	120
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.8	68	121
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	70	121
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	64	119
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	56	121
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	63	114
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.4	64	121
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	68	120
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	72	124
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.0	69	125

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518) - continued								
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	71	123
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	59	123
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	70	123
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.1	64	119
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.2	69	124
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	66	128
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	102	62	121
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	57	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	92.4	60	124
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	73	120
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	91.5	61	121
EP075(SIM)A: Phenolic Compounds (QCLot: 1926503)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	93.4	70	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	93.3	74	128
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	91.8	76	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	90.4	70	128
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	72.3	56	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	89.6	70	122
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	88.4	70	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	92.6	70	126
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	86.3	67	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	81.4	63	121
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	82.6	71	133
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	33.9	20	110
EP075(SIM)A: Phenolic Compounds (QCLot: 1926515)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	3 mg/kg	98.8	70	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	3 mg/kg	101	74	128
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	3 mg/kg	100	76	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	6 mg/kg	105	70	128
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	3 mg/kg	83.6	56	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	3 mg/kg	103	70	122
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	3 mg/kg	99.1	70	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	3 mg/kg	96.7	70	126
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	3 mg/kg	93.7	67	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	3 mg/kg	93.5	63	121
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	3 mg/kg	93.5	71	133
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	6 mg/kg	73.1	20	110
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926503)								

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926503) - continued								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	98.3	75	131
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	85.9	70	132
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	93.2	80	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	90.6	70	128
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	95.6	80	128
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	96.7	72	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	93.8	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	96.9	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	90.9	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	98.4	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	87.5	71	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	98.2	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	87.4	70	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	76.2	71	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	75.6	72	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	76.3	68	127
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926515)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	101	75	131
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	93.9	70	132
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	100	80	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	97.7	70	128
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	104	80	128
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	107	72	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	104	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	105	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	104	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	111	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	90.4	71	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	102	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	85.2	70	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	95.3	71	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	98.8	72	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	95.1	68	127
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 1928641)								
EP075-TAS: Benzo(a)pyrene	50-32-8	0.05	mg/kg	<0.05	2 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925188)								

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925188) - continued								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	80.4	70	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926502)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	106	80	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	113	84	115
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	104	80	112
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926517)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	96.4	80	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	99.2	84	115
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	91.0	80	112
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925188)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	77.0	68	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926502)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	109	83	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	111	82	114
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	106	73	115
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926517)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	99.3	83	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	95.7	82	114
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	85.0	73	115
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN (QCLot: 1925188)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	82.8	74	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	85.6	77	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	85.7	73	125
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	88.0	77	128
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	94.5	81	128
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	87.2	66	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925179)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	4331 µg/L	95.1	58	134
EP071: C15 - C28 Fraction	----	100	µg/L	<100	16952 µg/L	93.4	60	133

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925179) - continued								
EP071: C29 - C36 Fraction	----	50	µg/L	<50	8695 µg/L	94.2	54	137
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926039)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	360 µg/L	93.1	68	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925179)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	6292 µg/L	94.3	58	122
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	22143 µg/L	96.1	56	132
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1677 µg/L	94.5	58	137
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926039)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	450 µg/L	93.1	66	123
EP080: BTEXN (QCLot: 1926039)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	99.2	74	123
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	96.8	77	128
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	101	73	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	100	72	131
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	103	74	131
EP080: Naphthalene	91-20-3	5	µg/L	<5	5 µg/L	98.6	74	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 1926466)							
EM1814520-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	96.0	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	110	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	95.4	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.0	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	93.3	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	101	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	92.1	76	124
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	68	136
		EG005T: Molybdenum	7439-98-7	50 mg/kg	90.9	79	117
		EG005T: Nickel	7440-02-0	50 mg/kg	89.6	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	90.0	71	125

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1926466) - continued							
EM1814520-001	Anonymous	EG005T: Zinc	7440-66-6	50 mg/kg	90.2	74	128
EG005T: Total Metals by ICP-AES (QCLot: 1926468)							
EM1814532-011	SB2_0.5-0.6	EG005T: Lead	7439-92-1	50 mg/kg	94.3	76	124
EM1814532-011	SB2_0.5-0.6	EG005T: Arsenic	7440-38-2	50 mg/kg	94.5	78	124
		EG005T: Barium	7440-39-3	50 mg/kg	107	71	135
		EG005T: Beryllium	7440-41-7	50 mg/kg	98.5	85	125
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.5	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	79.9	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	101	82	124
		EG005T: Manganese	7439-96-5	50 mg/kg	# Not Determined	68	136
		EG005T: Molybdenum	7439-98-7	50 mg/kg	87.4	79	117
		EG005T: Nickel	7440-02-0	50 mg/kg	86.9	78	120
		EG005T: Selenium	7782-49-2	50 mg/kg	91.3	71	125
		EG005T: Zinc	7440-66-6	50 mg/kg	91.6	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926467)							
EM1814520-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	79.6	76	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926469)							
EM1814532-011	SB2_0.5-0.6	EG035T: Mercury	7439-97-6	5 mg/kg	86.3	76	116
EG048: Hexavalent Chromium (Alkaline Digest) (QCLot: 1926683)							
EM1814452-013	Anonymous	EG048G: Hexavalent Chromium	18540-29-9	40 mg/kg	75.8	58	114
EK026SF: Total CN by Segmented Flow Analyser (QCLot: 1927459)							
EM1814452-016	Anonymous	EK026SF: Total Cyanide	57-12-5	20 mg/kg	93.1	77	113
EK040T: Fluoride Total (QCLot: 1926668)							
EM1814562-001	Anonymous	EK040T: Fluoride	16984-48-8	400 mg/kg	103	70	130
EP004: Organic Matter (QCLot: 1927539)							
EM1814424-004	Anonymous	EP004: Organic Matter	----	1.03 %	84.2	70	120
		EP004: Total Organic Carbon	----	0.6 %	83.7	70	120
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1926516)							
EM1814401-004	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	89.0	44	144
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518)							
EM1814401-004	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	91.5	22	139
		EP068: Heptachlor	76-44-8	0.5 mg/kg	92.1	18	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	100	23	136
		EP068: Dieldrin	60-57-1	0.5 mg/kg	96.3	42	136
		EP068: Endrin	72-20-8	0.5 mg/kg	85.0	23	146

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1926518) - continued							
EM1814401-004	Anonymous	EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	70.2	20	133
EP075(SIM)A: Phenolic Compounds (QCLot: 1926503)							
EM1814532-006	SB2_0.2-0.3	EP075(SIM): Phenol	108-95-2	3 mg/kg	82.9	63	117
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	84.0	65	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	74.3	40	134
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	75.3	56	122
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	44.6	15	139
EP075(SIM)A: Phenolic Compounds (QCLot: 1926515)							
EM1814225-009	Anonymous	EP075(SIM): Phenol	108-95-2	3 mg/kg	98.1	63	117
		EP075(SIM): 2-Chlorophenol	95-57-8	3 mg/kg	97.8	65	123
		EP075(SIM): 2-Nitrophenol	88-75-5	3 mg/kg	82.3	40	134
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	3 mg/kg	93.4	56	122
		EP075(SIM): Pentachlorophenol	87-86-5	3 mg/kg	64.8	15	139
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926503)							
EM1814532-006	SB2_0.2-0.3	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	91.5	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	118	52	148
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1926515)							
EM1814225-009	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	98.6	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	104	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925188)							
EM1814532-003	QCP_7/9/18	EP080: C6 - C9 Fraction	----	28 mg/kg	92.5	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926502)							
EM1814532-003	QCP_7/9/18	EP071: C10 - C14 Fraction	----	806 mg/kg	91.9	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	96.2	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	86.0	64	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926517)							
EM1814401-003	Anonymous	EP071: C10 - C14 Fraction	----	806 mg/kg	96.4	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	98.5	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	90.3	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925188)							
EM1814532-003	QCP_7/9/18	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	89.4	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926502)							
EM1814532-003	QCP_7/9/18	EP071: >C10 - C16 Fraction	----	1160 mg/kg	93.6	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	92.7	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	89.6	44	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926517)							

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926517) - continued							
EM1814401-003	Anonymous	EP071: >C10 - C16 Fraction	----	1160 mg/kg	98.9	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	94.9	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	86.5	44	126
EP080: BTEXN (QCLot: 1925188)							
EM1814532-003	QCP_7/9/18	EP080: Benzene	71-43-2	2 mg/kg	115	50	136
		EP080: Toluene	108-88-3	2 mg/kg	115	56	139

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1925179)							
EM1814532-001	RB_7/9/18	EP071: C10 - C14 Fraction	----	4331 µg/L	86.1	50	130
		EP071: C15 - C28 Fraction	----	16952 µg/L	84.4	54	136
		EP071: C29 - C36 Fraction	----	8695 µg/L	85.2	50	142
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1926039)							
EM1814473-042	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	66.6	43	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1925179)							
EM1814532-001	RB_7/9/18	EP071: >C10 - C16 Fraction	----	6292 µg/L	85.0	50	128
		EP071: >C16 - C34 Fraction	----	22143 µg/L	86.8	50	150
		EP071: >C34 - C40 Fraction	----	1677 µg/L	89.4	51	159
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1926039)							
EM1814473-042	Anonymous	EP080: C6 - C10 Fraction	C6_C10	330 µg/L	65.0	44	122
EP080: BTEXN (QCLot: 1926039)							
EM1814473-042	Anonymous	EP080: Benzene	71-43-2	20 µg/L	85.7	68	130
		EP080: Toluene	108-88-3	20 µg/L	82.4	72	132

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1814532**	Page	: 1 of 10
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Melbourne
Contact	: ALEX LOVIBOND	Telephone	: +61-3-8549 9600
Project	: EMC1866	Date Samples Received	: 11-Sep-2018
Site	: North Hobart Oval	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND	No. of samples received	: 14
Order number	:	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
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Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075B: Polynuclear Aromatic Hydrocarbons	EM1814532--004	SB1_0.2-0.3	**Benzo(a)pyrene**	50-32-8	28.3 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1814520--001	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG005T: Total Metals by ICP-AES	EM1814532--011	SB2_0.5-0.6	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM1814515--004	Anonymous	**C29 - C36 Fraction**	----	95.4 %	0% - 50%	**RPD exceeds LOR based limits**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1814515--004	Anonymous	**>C16 - C34 Fraction**	----	61.0 %	0% - 50%	**RPD exceeds LOR based limits**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA001: pH in soil using 0.01M CaCl extract								
Soil Glass Jar - Unpreserved (EA001)								
SB1_1.0-1.1		**07-Sep-2018**	**13-Sep-2018**	14-Sep-2018	✓	**13-Sep-2018**	13-Sep-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
TB_7/9/18,	QCP_7/9/18,	**07-Sep-2018**	----	----	----	**11-Sep-2018**	21-Sep-2018	✓
SB1_0.2-0.3,	SB1_0.5-0.6,							
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB1_1.0-1.1,							
SB2_0.5-0.6,	SB4_1.3-1.4,							
SB5_0.5-0.6								
Soil Glass Jar - Unpreserved (EA055)								
SB3_0.4-0.5,	SB3_0.9-1.0	**10-Sep-2018**	----	----	----	**11-Sep-2018**	24-Sep-2018	✓

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006)							
SB1_1.0-1.1	07-Sep-2018	11-Sep-2018	05-Oct-2018	✓	14-Sep-2018	05-Oct-2018	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007)							
SB1_1.0-1.1	07-Sep-2018	11-Sep-2018	05-Oct-2018	✓	14-Sep-2018	05-Oct-2018	✓
ED008: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED008)							
SB1_1.0-1.1	07-Sep-2018	11-Sep-2018	05-Oct-2018	✓	14-Sep-2018	05-Oct-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB1_1.0-1.1, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	12-Sep-2018	06-Mar-2019	✓	12-Sep-2018	06-Mar-2019	✓
Soil Glass Jar - Unpreserved (EG005T)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	09-Mar-2019	✓	12-Sep-2018	09-Mar-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	12-Sep-2018	05-Oct-2018	✓	13-Sep-2018	05-Oct-2018	✓
Soil Glass Jar - Unpreserved (EG035T)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	08-Oct-2018	✓	13-Sep-2018	08-Oct-2018	✓
EG048: Hexavalent Chromium (Alkaline Digest)							
Soil Glass Jar - Unpreserved (EG048G)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	05-Oct-2018	✓	12-Sep-2018	19-Sep-2018	✓
EK026SF: Total CN by Segmented Flow Analyser							
Soil Glass Jar - Unpreserved (EK026SF)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	26-Sep-2018	✓
EK040T: Fluoride Total							
Soil Glass Jar - Unpreserved (EK040T)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	05-Oct-2018	✓	13-Sep-2018	05-Oct-2018	✓
EP004: Organic Matter							
Soil Glass Jar - Unpreserved (EP004)							
SB1_1.0-1.1	07-Sep-2018	13-Sep-2018	05-Oct-2018	✓	13-Sep-2018	05-Oct-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
SB1_0.2-0.3	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
SB1_0.2-0.3		07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved (EP075(SIM))								
SB1_0.2-0.3		07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
SB1_0.2-0.3,	SB1_0.5-0.6,	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB2_0.5-0.6,							
SB4_1.3-1.4,	SB5_0.5-0.6							
Soil Glass Jar - Unpreserved (EP075(SIM))								
SB3_0.4-0.5,	SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	24-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP075B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075-TAS)								
SB1_0.2-0.3,	SB1_0.5-0.6,	07-Sep-2018	13-Sep-2018	21-Sep-2018	✓	13-Sep-2018	23-Oct-2018	✓
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4								
Soil Glass Jar - Unpreserved (EP075-TAS)								
SB3_0.4-0.5		10-Sep-2018	13-Sep-2018	24-Sep-2018	✓	13-Sep-2018	23-Oct-2018	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
TB_7/9/18,	QCP_7/9/18,	07-Sep-2018	11-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
SB1_0.2-0.3,	SB1_0.5-0.6,							
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB2_0.5-0.6,							
SB4_1.3-1.4,	SB5_0.5-0.6							
Soil Glass Jar - Unpreserved (EP071)								
TB_7/9/18,	QCP_7/9/18,	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
SB1_0.2-0.3,	SB1_0.5-0.6,							
SB2_0.2-0.3,	SB4_0.2-0.3,							
SB5_0.3-0.4,	SB2_0.5-0.6,							
SB4_1.3-1.4,	SB5_0.5-0.6							
Soil Glass Jar - Unpreserved (EP080)								
SB3_0.4-0.5,	SB3_0.9-1.0	10-Sep-2018	11-Sep-2018	24-Sep-2018	✓	13-Sep-2018	24-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)								
SB3_0.4-0.5,	SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	24-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓

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Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
TB_7/9/18, QCP_7/9/18, SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	11-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)							
TB_7/9/18, QCP_7/9/18, SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	11-Sep-2018	24-Sep-2018	✓	13-Sep-2018	24-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP071)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	12-Sep-2018	24-Sep-2018	✓	12-Sep-2018	22-Oct-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TB_7/9/18, QCP_7/9/18, SB1_0.2-0.3, SB1_0.5-0.6, SB2_0.2-0.3, SB4_0.2-0.3, SB5_0.3-0.4, SB2_0.5-0.6, SB4_1.3-1.4, SB5_0.5-0.6	07-Sep-2018	11-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
Soil Glass Jar - Unpreserved (EP080)							
SB3_0.4-0.5, SB3_0.9-1.0	10-Sep-2018	11-Sep-2018	24-Sep-2018	✓	13-Sep-2018	24-Sep-2018	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	14-Sep-2018	✓	13-Sep-2018	22-Oct-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	14-Sep-2018	✓	13-Sep-2018	22-Oct-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
RB_7/9/18	07-Sep-2018	12-Sep-2018	21-Sep-2018	✓	13-Sep-2018	21-Sep-2018	✓

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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	35	11.43	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	38	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Project : EMC1866

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Organic Matter	EP004	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	38	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Cyanide by Segmented Flow Analyser	EK026SF	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Fluoride	EK040T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	38	7.89	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
TRH - Semivolatile Fraction	EP071	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
TRH - Semivolatile Fraction	EP071	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 8 of 10
Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl2 extract	EA001	SOIL	In house: Referenced to Rayment and Lyons (2011) 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Exchangeable Cations on Alkaline Soils	* ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Hexavalent Chromium by Alkaline Digestion and DA Finish	EG048G	SOIL	In house: Referenced to USEPA SW846, Method 3060A. Hexavalent chromium is extracted by alkaline digestion. The digest is determined by photometrically by automatic discrete analyser, following pH adjustment. The instrument uses colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Cyanide by Segmented Flow Analyser	EK026SF	SOIL	In house: Referenced to APHA 4500-CN C / ASTM D7511. Caustic leachates of soil samples are introduced into an automated segmented flow analyser. Complex bound cyanide is decomposed in a continuously flowing stream, at a pH of 3.8, by the effect of UV light. A UV-B lamp (312 nm) and a decomposition spiral of borosilicate glass are used to filter out UV light with a wavelength of less than 290 nm thus preventing the conversion of thiocyanate into cyanide. The hydrogen cyanide present at a pH of 3.8 is separated by gas dialysis. The hydrogen cyanide is then determined photometrically, based on the reaction of cyanide with chloramine-T to form cyanogen chloride. This then reacts with 4-pyridine carboxylic acid and 1,3-dimethylbarbituric acid to give a red colour which is measured at 600 nm. This method is compliant with NEPM (2013) Schedule B(3)

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Work Order : EM1814532
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Methods	Method	Matrix	Method Descriptions
Total Fluoride	EK040T	SOIL	(In-house) Total fluoride is determined by ion specific electrode (ISE) in a solution obtained after a Sodium Carbonate / Potassium Carbonate fusion dissolution.
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3).
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
Benzo(a)pyrene- Waste Classification (TAS requirements)	EP075-TAS	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 502)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for CN in Soils	CN-PR	SOIL	In house: APHA 4500 CN. Samples are extracted by end-over-end tumbling with NaOH.
pH in soil using a 0.01M CaCl2 extract	EA001-PR	SOIL	In house: Referenced to Rayment and Higginson 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl2 and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons 2011 method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Alkaline digestion for Hexavalent Chromium	EG048PR	SOIL	In house: Referenced to USEPA SW846, Method 3060A.
Total Fluoride	EK040T-PR	SOIL	In house: Samples are fused with Sodium Carbonate / Potassium Carbonate flux.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach following drying at 40°C	EN34-AD	SOIL	10 g of 40°C dried soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids - VIC EPA Screen	ORG17-EM	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

TNT 9820 0322 7963

2018 EMBC Air Canister Chain Of Custody V1

Chain of Custody and Analysis Request

Page : 1 of 1

Site Name:	North Hobart Oval	**Client :**	**Environmental Management and Consulting Pty Ltd**	**Primary Laboratory**	**Secondary Laboratory**
Project No.:	EMC1866	**Quote Number:**	**MEBQ/117/16**	*ALS Laboratory Group*	**Eurofins MGT**
Sampled By:	**Alex Lovibond**	**Project Manager :**	**Simon Chilsett**	*5/585 Maitland Rd*	2-5 Kingston Town Close
Phone :	**0439 306 677**	**Phone :**	**0428 288 258**	*Mayfield West, NSW 2304*	Oakleigh, VIC, 3168
Canister Req. No.:	-	**INVOICES TO:**	admin@enviromac.com.au	Phone : *02 4014 2500*	Phone : 03) 9564 7055
EDD Format (or Default):	Default			Samples.newcastle@alsglobal.com	

em&c

RESULTS : Results Required By: 24hrs 48hrs 3 days 5 days other: _____
Additional fee +40% +20% +10%

Send Results & Copy of COC to:

Simon Chilsett	**Alex Lovibond**	**Tom Latham**
Email: simon@enviromac.com.au	***Email:*** alex@enviromac.com.a	***Email:*** Tom@enviromac.com.au
Phone: 0428 288 258	***Phone:*** 0439 306 677	***Phone:*** 0488 515 991

GAS SAMPLE INFORMATION							Reporting Requirements					Analysis Requested					Additional Information
ALS Use Only	Sample Details						LORs			Units		Suite Codes must be listed to attract suite price					
Lab ID	Tedlar Bag ID	Estimated Sample Volume (L)		Date (Time Sampled)	Matrix (eg Air, Soil Gas)		Ambient Air	Soil Gas (NEPM)	Other / Indoor	ppbv, µg/m3	ppmv, mg/m3	EP101-NSG - NEPM Suite. BTEXN + Vinyl Chloride, PCE, TCE, TCA, cis-1,2-Dichloroethene (12 Analytes, 6 Fractions incl' calculated F1,F2)	EP104-PVI – CRCCARE PVI Guidance Key Indicator Gases (4 analytes: He, O2, CO2 + CH4)	EP103-PHSG – Total Petroleum Hydrocarbons and NEPM TRH to C16 (13 Analytes and 6 Fractions incl' calculated F1, F2)			Comments on LORs required, potential hazards, likely contaminant levels, or samples requring specific QC analysis etc
1	SV1_0.8-1.0	2		11/09/2018 (3:00 PM)	Soil Gas		-	x	-	x	-	x	x				
	QCP_11/09/18	2		11/09/2018 (3:00 PM)	Soil Gas		-	x	-	x	-			x			

Environmental Division
Newcastle
Work Order Reference
EN1805943

Telephone : - 61 2 4014 2500

Relinq. By: Alex Lovibond	Date: 11/09/18	Couriered By:	Date:	Received By:
Signature:	Time: 2:00PM	Signature:	Time	Signature:

Date: 12/9/18
Time: 9am

Lab Use Only			
Custody Seal Intact?	Rec. Lab Y / N	NEY / N	N / A
Valves closed on Rec.?	Rec. Lab Y / N	NEY / N	N / A
Canister/Sampler Complete and Not damaged?			Y / N
Other Coments?		Temp Rec:	

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EN1805943**

Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Contact	:
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
E-mail	: simon@enviromac.com.au	E-mail	:
Telephone	: +61 0408 391 738	Telephone	: +61 2 4014 2500
Facsimile	: +61 03 6231 5979	Facsimile	: +61 2 4967 7382
Project	: EMC1866	Page	: 1 of 3
Order number	:	Quote number	: EB2017ENVMANCON0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: North Hobart Oval		
Sampler	: ALEX LOVIBOND		

Dates

Date Samples Received	: 12-Sep-2018 09:00	Issue Date	: 12-Sep-2018
Client Requested Due Date	: 19-Sep-2018	Scheduled Reporting Date	: **19-Sep-2018**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	: Tedlar bag for sample "QCP_11/09/18" received deflated with insufficient volume to analyse.	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables

Issue Date	: 12-Sep-2018
Page	: 2 of 3
Work Order	: EN1805943 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method *Client sample ID*	Sample Container Received	Preferred Sample Container for Analysis
VOCs in Air by USEPA TO15r - Extended Suite : EP101-15X		
SV1_0.8-1.0	- Tedlar bag	- Gas Canister - ALS Stainless Steel Silonite
Volatile TPH/TRH in Gaseous Samples : EP103-PC		
SV1_0.8-1.0	- Tedlar bag	- Gas Canister - ALS Stainless Steel Silonite

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **AIR**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	AIR - EP104-PVI CRCCare PVI - Key Indicators - Gases	AIR - SG-V2-PH Soil Gas - BTEXN + NEPM TPH + Chlorinated
EN1805943-001	11-Sep-2018 15:00	SV1_0.8-1.0	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Issue Date	: 12-Sep-2018
Page	: 3 of 3
Work Order	: EN1805943 Amendment 0
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L

Requested Deliverables

ALEX LOVIBOND		
- *AU Certificate of Analysis - NATA (COA)	Email	alex@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - USEPA (QC-USEPA)	Email	alex@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	alex@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	alex@enviromac.com.au
- EDI Format - ESDAT (ESDAT)	Email	alex@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	alex@enviromac.com.au
ALL INVOICES		
- A4 - AU Tax Invoice (INV)	Email	admin@enviromac.com.au
SIMON CHISLETT		
- *AU Certificate of Analysis - NATA (COA)	Email	simon@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	simon@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - USEPA (QC-USEPA)	Email	simon@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	simon@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	simon@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	simon@enviromac.com.au
- EDI Format - ESDAT (ESDAT)	Email	simon@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	simon@enviromac.com.au
TOM LATHAM		
- *AU Certificate of Analysis - NATA (COA)	Email	tom@enviromac.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom@enviromac.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - USEPA (QC-USEPA)	Email	tom@enviromac.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom@enviromac.com.au
- Chain of Custody (CoC) (COC)	Email	tom@enviromac.com.au
- EDI Format - ENMRG (ENMRG)	Email	tom@enviromac.com.au
- EDI Format - ESDAT (ESDAT)	Email	tom@enviromac.com.au
- EDI Format - XTab (XTAB)	Email	tom@enviromac.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EN1805943**	Page	: 1 of 6
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Contact	:
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 0408 391 738	Telephone	: +61 2 4014 2500
Project	: EMC1866	Date Samples Received	: 12-Sep-2018 09:00
Order number	:	Date Analysis Commenced	: 12-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018 16:46
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP101: ALS quality procedures (QWI-EN/38) permit, for organic trace analysis, that the recoveries of 20% of target compounds may lie outside of established control limits as long as these remain within acceptable ranges defined within referenced USEPA methods.
- EP101, EP103: Results reported in µg/m³ are calculated from PPBV results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa.
- CAN-001: Results for Pressure - As Received are measured under controlled conditions using calibrated laboratory gauges. These results are expressed as an Absolute Pressure. Equivalent gauge pressures may be calculated by subtracting the Pressure - Laboratory Atmosphere taken at the time of measurement.
- CAN-001: Results for Pressure - Gauge as Received are obtained from uncalibrated field gauges and are indicative only. These results may not precisely match calibrated gauge readings and may vary from field measurements due to changes in temperature and pressure
- EP104: Results reported in mg/m³ are calculated from Mol% results based on a temperature of 25°C and atmospheric pressure of 101.3 kPa
- EP104: Sample canisters were received at sub-ambient pressures and required dilution in the laboratory prior to analysis. LOR values have been adjusted accordingly

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Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Analytical Results

Sub-Matrix: AIR (Matrix: AIR)				Client sample ID	SV1_0.8-1.0	----	----	----	----
				Client sampling date / time	11-Sep-2018 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EN1805943-001	--------	--------	--------	--------
					Result	----	----	----	----
EP104: Light Hydrocarbons									
Methane	74-82-8	0.050	Mol %		<0.100	----	----	----	----
EP104: Light Hydrocarbons (Calc Conc)									
Methane	74-82-8	330000	µg/m³		<660000	----	----	----	----
EP104: Permanent Gases									
Carbon Dioxide	124-38-9	0.050	Mol %		**2.81**	----	----	----	----
Oxygen	7782-44-7	0.10	Mol %		**17.7**	----	----	----	----
Helium	7440-59-7	0.005	Mol %		<0.010	----	----	----	----
EP104: Permanent Gases (Calc Conc)									
Carbon Dioxide	124-38-9	900000	µg/m³		**50500000**	----	----	----	----
Oxygen	7782-44-7	1310000	µg/m³		**231000000**	----	----	----	----
Helium	7440-59-7	8000	µg/m³		<16000	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	SV1_0.8-1.0	----	----	----	----
				Client sampling date / time	11-Sep-2018 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EN1805943-001	--------	--------	--------	--------	--------
				Result	----	----	----	----	----
EP101: VOCs by USEPA Method TO15 (Calculated Concentration)									
Vinyl chloride	75-01-4	5.1	µg/m³	<5.1	----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	20.0	µg/m³	<20.0	----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	270	µg/m³	<270	----	----	----	----	----
Benzene	71-43-2	100	µg/m³	<100	----	----	----	----	----
Trichloroethene	79-01-6	5.4	µg/m³	<5.4	----	----	----	----	----
Toluene	108-88-3	190	µg/m³	<190	----	----	----	----	----
Tetrachloroethene	127-18-4	340	µg/m³	<340	----	----	----	----	----
Ethylbenzene	100-41-4	220	µg/m³	<220	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	430	µg/m³	<430	----	----	----	----	----
ortho-Xylene	95-47-6	220	µg/m³	<220	----	----	----	----	----
Naphthalene	91-20-3	100	µg/m³	<100	----	----	----	----	----
EP101: VOCs by USEPA Method TO15r									
Vinyl chloride	75-01-4	2.0	ppbv	<2.0	----	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	5.0	ppbv	<5.0	----	----	----	----	----
1.1.1-Trichloroethane	71-55-6	50.0	ppbv	<50.0	----	----	----	----	----
Benzene	71-43-2	30.0	ppbv	<30.0	----	----	----	----	----
Trichloroethene	79-01-6	1.0	ppbv	<1.0	----	----	----	----	----
Toluene	108-88-3	50.0	ppbv	<50.0	----	----	----	----	----
Tetrachloroethene	127-18-4	50.0	ppbv	<50.0	----	----	----	----	----
Ethylbenzene	100-41-4	50.0	ppbv	<50.0	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	100	ppbv	<100	----	----	----	----	----
ortho-Xylene	95-47-6	50.0	ppbv	<50.0	----	----	----	----	----
Naphthalene	91-20-3	19.0	ppbv	<19.0	----	----	----	----	----
EP103: Petroleum Hydrocarbons in Gaseous Samples									
C6 - C9 Fraction	----	5000	ppbv	<5000	----	----	----	----	----
C10 - C14 Fraction	----	5000	ppbv	<5000	----	----	----	----	----
EP103: Petroleum Hydrocarbons in Gaseous Samples (Calc Conc)									
C6 - C9 Fraction	----	20000	µg/m³	<20000	----	----	----	----	----
C10 - C14 Fraction	----	35000	µg/m³	<35000	----	----	----	----	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013									
C6 - C10 Fraction	C6_C10	5000	ppbv	<5000	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	5000	ppbv	<5000	----	----	----	----	----
>C10 - C16 Fraction	----	5000	ppbv	<5000	----	----	----	----	----

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Analytical Results

Sub-Matrix: SOIL GAS (Matrix: AIR)				Client sample ID	SV1_0.8-1.0	----	----	----	----
				Client sampling date / time	11-Sep-2018 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EN1805943-001	--------	--------	--------	--------
					Result	----	----	----	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013 - Continued									
>C10 - C16 Fraction minus Naphthalene (F2)	----	5000	ppbv		<5000	----	----	----	----
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (Calc Conc)									
C6 - C10 Fraction	C6_C10	20000	µg/m³		<20000	----	----	----	----
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20000	µg/m³		<20000	----	----	----	----
>C10 - C16 Fraction	----	40000	µg/m³		<40000	----	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	40000	µg/m³		<40000	----	----	----	----
USEPA Air Toxics Method TO15r Surrogates									
4-Bromofluorobenzene	460-00-4	0.5	%		87.6	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL GAS

Compound	CAS Number	Recovery Limits (%) Low	High
USEPA Air Toxics Method TO15r Surrogates			
4-Bromofluorobenzene	460-00-4	60	140

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EN1805943**	Page	: 1 of 4
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Contact	:
Address	: LEVEL 2 BIGGENS BUILDING 67 LETITIA STREET NORTH HOBART TASMANIA, AUSTRALIA 7000	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 0408 391 738	Telephone	: +61 2 4014 2500
Project	: EMC1866	Date Samples Received	: 12-Sep-2018
Order number	:	Date Analysis Commenced	: 12-Sep-2018
C-O-C number	: ----	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND		
Site	: North Hobart Oval		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report ; Recovery and Acceptance Limits
- Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dale Semple	Analyst	Newcastle - Organics, Mayfield West, NSW
Daniel Junek	Senior Air Analyst	Newcastle - Organics, Mayfield West, NSW

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Work Order : EN1805943
Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **AIR**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP101: VOCs by USEPA Method TO15r (QC Lot: 1927629)									
EN1805774-001	Anonymous	EP101-15X: Vinyl chloride	75-01-4	0.5	ppbv	<2.0	<2.0	0.00	No Limit
		EP101-15X: cis-1.2-Dichloroethene	156-59-2	0.5	ppbv	<5.0	<5.0	0.00	No Limit
		EP101-15X: 1.1.1-Trichloroethane	71-55-6	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Benzene	71-43-2	0.5	ppbv	<30.0	<30.0	0.00	No Limit
		EP101-15X: Trichloroethene	79-01-6	0.5	ppbv	<1.0	<1.0	0.00	No Limit
		EP101-15X: Toluene	108-88-3	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Tetrachloroethene	127-18-4	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Ethylbenzene	100-41-4	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: ortho-Xylene	95-47-6	0.5	ppbv	<50.0	<50.0	0.00	No Limit
		EP101-15X: Naphthalene	91-20-3	0.5	ppbv	<19.0	<19.0	0.00	No Limit
		EP101-15X: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	<100	<100	0.00	No Limit
EP103: Petroleum Hydrocarbons in Gaseous Samples (QC Lot: 1927630)									
EN1805774-001	Anonymous	EP103-PC: C6 - C9 Fraction	----	50	ppbv	<5000	<5000	0.00	No Limit
		EP103-PC: C10 - C14 Fraction	----	50	ppbv	<5000	<5000	0.00	No Limit
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 1927630)									
EN1805774-001	Anonymous	EP103-PC: C6 - C10 Fraction	C6_C10	50	ppbv	<5000	<5000	0.00	No Limit
		EP103-PC: >C10 - C16 Fraction	----	50	ppbv	<5000	<5000	0.00	No Limit
EP104: Light Hydrocarbons (QC Lot: 1932086)									
EN1805919-001	Anonymous	EP104: Methane	74-82-8	0.05	Mol %	<0.125	<0.125	0.00	0% - 20%
EN1805943-001	SV1_0.8-1.0	EP104: Methane	74-82-8	0.05	Mol %	<0.100	<0.100	0.00	0% - 20%
EP104: Permanent Gases (QC Lot: 1932086)									
EN1805919-001	Anonymous	EP104: Carbon Dioxide	124-38-9	0.005	Mol %	0.043	0.041	4.95	0% - 20%
		EP104: Helium	7440-59-7	0.005	Mol %	<0.012	<0.012	0.00	0% - 20%

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Client : ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project : EMC1866

Sub-Matrix: **AIR**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP104: Permanent Gases (QC Lot: 1932086) - continued									
EN1805919-001	Anonymous	EP104: Oxygen	7782-44-7	0.1	Mol %	20.4	20.5	0.683	0% - 20%
EN1805943-001	SV1_0.8-1.0	EP104: Carbon Dioxide	124-38-9	0.005	Mol %	2.81	2.79	0.540	0% - 20%
		EP104: Helium	7440-59-7	0.005	Mol %	<0.010	<0.010	0.00	0% - 20%
		EP104: Oxygen	7782-44-7	0.1	Mol %	17.7	18.0	1.85	0% - 20%

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Work Order	: EN1805943
Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control terms Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (DCS) refers to certified reference materials, or known interference free matrices spiked with target analytes. The purpose of these QC parameters are to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS and DCS.

Sub-Matrix: **AIR**

		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	DCS	Low	High	Value	Control Limit
EP101: VOCs by USEPA Method TO15r (QCLot: 1927629)											
EP101-15X: Vinyl chloride	75-01-4	0.5	ppbv	<0.5	10 ppbv	106	106	76	130	25	25
EP101-15X: cis-1.2-Dichloroethene	156-59-2	0.5	ppbv	<0.5	10 ppbv	104	103	80	114	25	25
EP101-15X: 1.1.1-Trichloroethane	71-55-6	0.5	ppbv	<0.5	10 ppbv	104	101	84	117	25	25
EP101-15X: Benzene	71-43-2	0.5	ppbv	<0.5	10 ppbv	106	105	81	113	25	25
EP101-15X: Trichloroethene	79-01-6	0.5	ppbv	<0.5	10 ppbv	105	104	84	116	25	25
EP101-15X: Toluene	108-88-3	0.5	ppbv	<0.5	10 ppbv	# 122	# 122	79	120	25	25
EP101-15X: Tetrachloroethene	127-18-4	0.5	ppbv	<0.5	10 ppbv	106	105	77	124	25	25
EP101-15X: Ethylbenzene	100-41-4	0.5	ppbv	<0.5	10 ppbv	108	108	81	120	25	25
EP101-15X: meta- & para-Xylene	108-38-3 106-42-3	1	ppbv	<1.0	20 ppbv	106	105	80	125	25	25
EP101-15X: ortho-Xylene	95-47-6	0.5	ppbv	<0.5	10 ppbv	109	108	82	122	25	25
EP101-15X: Naphthalene	91-20-3	0.5	ppbv	<0.5	10 ppbv	83.8	84.0	70	130	25	25
EP103: Petroleum Hydrocarbons in Gaseous Samples (QCLot: 1927630)											
EP103-PC: C6 - C9 Fraction	----	50	ppbv	<50	2800 ppbv	100	101	70	130	25	25
EP103-PC: C10 - C14 Fraction	----	50	ppbv	<50	1200 ppbv	96.9	98.4	70	130	25	25
EP103: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 1927630)											
EP103-PC: C6 - C10 Fraction	C6_C10	50	ppbv	<50	3000 ppbv	99.1	100	70	130	25	25
EP103-PC: >C10 - C16 Fraction	----	50	ppbv	<50	500 ppbv	98.7	99.9	70	130	25	25
EP104: Light Hydrocarbons (QCLot: 1932086)											
EP104: Methane	74-82-8	0.05	Mol %	<0.050	0.105 Mol %	91.0	91.9	90	110	25	25
EP104: Permanent Gases (QCLot: 1932086)											
EP104: Carbon Dioxide	124-38-9	0.005	Mol %	<0.005	5.276 Mol %	91.7	91.5	90	110	25	25
EP104: Helium	7440-59-7	0.005	Mol %	<0.005	0.105 Mol %	93.6	92.1	90	110	25	25
EP104: Oxygen	7782-44-7	0.1	Mol %	<0.10	9.304 Mol %	98.6	101	90	110	25	25

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EN1805943**	Page	: 1 of 5
Client	: **ENVIRONMENTAL MANAGEMENT & CONSULTING P/L**	Laboratory	: Environmental Division Newcastle
Contact	: MR SIMON CHISLETT	Telephone	: +61 2 4014 2500
Project	: EMC1866	Date Samples Received	: 12-Sep-2018
Site	: North Hobart Oval	Issue Date	: 17-Sep-2018
Sampler	: ALEX LOVIBOND	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

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Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **AIR**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP101: VOCs by USEPA Method TO15r	QC-1927629-002	----	**Toluene**	108-88-3	122 %	79-120%	**Recovery greater than upper control limit**
Duplicate Control Spike (DCS) Recoveries							
EP101: VOCs by USEPA Method TO15r	QC-1927629-003	----	**Toluene**	108-88-3	122 %	79-120%	**Recovery greater than upper control limit**

Outliers : Frequency of Quality Control Samples

Matrix: **AIR**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Duplicate Control Samples (DCS)					
Permanent Gases and Light Hydrocarbons	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)					
Permanent Gases and Light Hydrocarbons	1	11	9.09	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **AIR** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
EP101: VOCs by USEPA Method TO15r							
Tedlar bag (EP101-15X) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**12-Sep-2018**	11-Oct-2018	✓
EP103: Petroleum Hydrocarbons in Gaseous Samples							
Tedlar bag (EP103-PC) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**12-Sep-2018**	11-Oct-2018	✓
EP103: Total Recoverable Hydrocarbons - NEPM 2013							
Tedlar bag (EP103-PC) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**12-Sep-2018**	11-Oct-2018	✓
EP104: Light Hydrocarbons							
Tedlar bag (EP104) SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**14-Sep-2018**	14-Sep-2018	✓

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Client	: ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	: EMC1866

Matrix: **AIR**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP104: Permanent Gases							
Tedlar bag (EP104)							
SV1_0.8-1.0	**11-Sep-2018**	----	----	----	**14-Sep-2018**	14-Sep-2018	✓

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Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **AIR**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Duplicate Control Samples (DCS)							
Permanent Gases and Light Hydrocarbons	EP104	1	11	9.09	10.00	×	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Duplicates (DUP)							
Permanent Gases and Light Hydrocarbons	EP104	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Permanent Gases and Light Hydrocarbons	EP104	1	11	9.09	10.00	×	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Permanent Gases and Light Hydrocarbons	EP104	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile TPH/TRH in Gaseous Samples	EP103-PC	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page	:	5 of 5
Work Order	:	EN1805943
Client	:	ENVIRONMENTAL MANAGEMENT & CONSULTING P/L
Project	:	EMC1866

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
VOCs in Air by USEPA TO15r - Extended Suite	EP101-15X	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite
VOCs in Air by USEPA TO15r - Extended Suite (mass/volume)	EP101-15X-MV	AIR	In house: Referenced to USEPA TO15r Volatile Organic Compounds in Air by USEPA TO15. Extended Suite (Calculated Concentration)
Volatile TPH/TRH in Gaseous Samples	EP103-PC	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013)
Volatile TPH/TRH in Gaseous Samples (Calc Conc)	EP103-PC-MV	AIR	Volatile TPH/TRH by GC-MS with Preconcentration and Thermal Desorption Injection Based on USEPA TO15, MassDEP APH (Rev1 2009) and TPH/NEPM Fractions (2013) Calculated from ppbv results based on given Temperature and Atmospheric Pressure and mid-range molecular weights
Permanent Gases and Light Hydrocarbons	EP104	AIR	Hydrocarbons, Carbon Dioxide and Carbon Monoxide by GC-FID-TCD. Gases by GC-TCD In house: Referenced to ASTM D1945 applied to Gases and Light Hydrocarbons (C1-C4) using capillary GC
Permanent Gases and Light Hydrocarbons (mass/volume)	EP104-MV	AIR	Permanent Gases and Light Hydrocarbons - Calculated as mass/volume concentration from percentage composition and given termperature and pressure.

Appendix D

Assessment Data Quality Indicator (DQI) Checklist

Data Quality Indicatiors Checklis

List the laboratory batch numbers in the reporting period to which this DQI checklist relates				
Report ID	**Report Description**			**Report Issue Date**
EM1814532	Soil assessment			17/09/18
EN1805943	Soil Vapour Assessment			17/09/18
		Yes	**No**	**NA**
Are all laboratory reports included within EM&C report as an appendix?				
Comments: SRN, CoA, QC, QCI and CoC supplied				
Comparability (the confident expressed qualitatively that data may be considered to be equivalent for each sampling and analytical event)				
		Yes	**No**	**NA**
Was the EM&C Standard Operating Procedure for sampling used?				
Comments:				
Were consistent sample types collected according to SAQP?				
Comments:				
Who was conducting the sampling?				
Comments: Soil and soil vapour sampling was conducted by Alex Lovibond.				
Was the same laboratory and laboratory method used?				
Comments:				
Have the same units of measurement been used?				
Comments:				
Were climate conditions recorded? (if relevant)				
Comments:				

Data Quality Indicators Checklis

Precision (a quantitative measure of the variability (or reproducibility) of data)			
	Yes	No	NA
Is the blind duplicate/split ID generic and does it not reveal the reference sample ID?			
Comments:			
Is RPD within 0-50% for samples with concentrations >10*LOR and within 100% for samples with concentration <10*LOR:			
Comments: See Tables 4a and 4b for full RPD analysis			
Has the Primary laboratory QA/QC reported any anomalies?			
Comments: Where outliers exist, comments will be provided below the report ID			

	Intra Lab QCS					Analysis Holding Time	Frequency of Intra Lab QC Samples	
Report ID	Lab Method Blank	Lab Control	Matrix Spike	Lab Duplicate	Surrogate Recovery	Holding Time breach	Frequency Breach	Report Issue Date
EM1814532	No	No	Yes	Yes	No	No	No	17/09/18
Matrix Spike: EP075B: Polynuclear Aromatic Hydrocarbons - RPD exceeds LOR based limits. Calculated RPD limits: 0%-20%. Actual result 28.3%. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Lab Duplicate: EP080/071: Total Petroleum Hydrocarbons - RPD exceeds LOR based limits. Calculated RPD limits: 0%-50%. Actual result 95.4%. This intra lab QAQC result was taken from a sample not part of this assessments samples, but from an external sample analysed as part of the laboratory batch. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Lab Duplicate: Total Recoverable Hydrocarbons - NEPM 2013 fractions - RPD exceeds LOR based limits. Calculated RPD limits: 0%-50%. Actual result 61.0%. This intra lab QAQC result was taken from a sample not part of this assessments samples, but from an external sample analysed as part of the laboratory batch. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Lab Duplicate: EG005T: Total Metals by ICP-AES - MS recovery not determined, background level greater than or equal to 4x spike level. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
EP071 and EP071/-SV: Intra Lab Quality Control Sample Frequency Outliers exist. Not enough duplicate sample bottles provided for intra lab duplicate and/or QC matix spike testing. This result may be due to standard laboratory practice of running samples through in grouped project 'analytical lots'. This practise may involve splitting EM&Cs submitted samples over multiple analytical lots. EM&C have no control over the number of intra lab duplicates in which their samples are analysed, other than providing additional sample bottles at the specified frequency (a practise that was observed in this instance). Even when this practice is observed, the splitting of EM&Cs sample bottles over multiple 'analytical lots' may result in a non compliance, due to a lack of frequency of quality control samples provided to the laboratory. This reported QSC breach considered minor and not significant enough to compromise the integrety of specific batch ID.								
EN1805943	No	Yes	No	No	No	No	Yes	17/09/18
Lab Control: EP101: VOCs by USEPA Method TO15r - Recovery greater than upper control limit. Calculated Limits: 79-120%. Actual Result 122%. This reported QSC breach considered minor and not significant enough to compromise the integrety of the specific batch ID.								
Frequency of Intra Lab QC Samples: Permanent Gases and Light Hydrocarbons - Intra Lab Quality Control Sample Frequency Outliers exist. Not enough duplicate sample bags provided for intra lab duplicate and/or QC matix spike testing. This result may be due to standard laboratory practice of running samples through in grouped project 'analytical lots'. This practise may involve splitting EM&Cs submitted samples over multiple analytical lots. EM&C have no control over the number of intra lab duplicates in which their samples are analysed, other than providing additional sample bags at the specified frequency. Even when this practice is observed, the splitting of EM&Cs samples over multiple 'analytical lots' may result in a non compliance, due to a lack								

Accuracy (a quantitative measure of the closeness of the reported data to the true value)			
	Yes	No	NA
Was the field equipment calibrated?			
Comments: See Calibration Certificates Attached in Appendix E			
Have trip, field and rinsate samples been collected?			
Comments: Rinsate and trip blanks were utilised. A field blank sample was deemed to be unrequired by EM&C.			

Data Quality Indicators Checklis

Representativeness (the confidence expressed qualitatively that are representative of each media type present on the site under investigation)			
	Yes	No	NA
Has the appropriate media been sampled and analysed in accordance with the SAQP?			
Comments:			
Has all media identified in the SAQP been sampled?			
Comments:			
Have Chain of Custodies been completed?			
Comments:			
Have the samples been collected in the appropriate containers?			
Comments:			
Have the samples been stored, preserved and handled appropriately and received at the laboratory at acceptable temperature?			
Comments:			
Has any contamination been identified in blank samples?			
Comments:			
Have any uncertainties been identified in:			
Sampling methods			
Comments:			
Laboratory Methods			
Comments:			
Groundwater well integrity or network			
Comments:			
Soil vapour bore integrity			
Comments:			

Completeness (a measure of the amount of usable data contributing to the entire data set)			
	Yes	No	NA
Have all critical site locations been sampled in accordance with the SAQP?			
Comments:			
Has the Technical Holding Times been met?			
Comments:			
Is field and laboratory documentation correct, legible and authorised by signature and date?			
Comments:			

	Acceptable
	Acceptable, irragularities has been noted
	Not acceptable

Appendix E

Assessment Field Logs and Calibration Certificates

Soil Bore ID:	Site Name:	North Hobart Oval
SB1	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.08-1.1
☐ NDD		
☐ Hollow Auger		
☑ CROWBAR		0.0-0.08
☐		

Method of abandoning soil bore
- ☑ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

Dark Grey, Grey, Light Grey, Dark Brown, Brown, Light Brown

Plasticity	Range of Liquid Limit
Low	<35%
Medium	>35% - <50%
High	>50%

Particle Characteristics (Sand and Gravel Only)
- W Well Graded
- P Poorly Graded
- G Gap Graded
- U Uniform

Moisture Content: Dry, Moist, Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency	Sample ID	Bagged PID	Analysed/ QC sample ID
0.0	0.08	ASPHALT								SB1_0.1-0.2	0.0	
0.08	0.3	VC SAND	C Sand	M Gravel	SW	well graded	Dark Brown	DRY	Fill	SB1_0.2-0.3	0.0	Y/QCP
0.3	0.6	M SAND	S.Lt	Clay	SM	low Plas.	Dark Brown	Dry		SB1_0.3-0.4	0.0	
0.6	1.1	VC SAND	C Sand	F Gravel	SW	well graded	light Brown	Dry		SB1_0.5-0.6	0.0	Y
										SB1_0.6-0.7	0.0	
										SB1_1.0-1.1	0.0	Y
		EOB @ 1.1 end of investigation										

Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Well Construction Details

Concrete:	-
Bentonite:	-
Sand:	-
Screen Interval:	-

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes:
Concrete
Bentonite
Sand
Well casing

DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									Rock Fragments					
	CLAY		SILT		SAND					GRAVEL			COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Oval
SB2	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.08
☐ NDD		
☐ Hollow Auger		
☑ CROW BAR	-	0.08-0.08
☐		

Method of abandoning soil bore
- ☐ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

Dark Grey, Grey, Light Grey, Dark Brown, Brown, Light Brown

Plasticity	Range of Liquid Limit
Low	<35%
Medium	>35% - <50%
High	>50%

Particle Characteristics (Sand and Gravel Only): W Well Graded; P Poorly Graded; G Gap Graded; U Uniform

Moisture Content: Dry; Moist; Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency	Sample ID	Bagged PID	Analysed/ QC sample ID
0.0	0.08	ASPHALT								SB2_0.2-0.3	0.0	Y
0.08	0.3	VC SAND	C Sand	M Gravel	SW	well Graded	Dark Brown	Dry	F.11	SB2_0.3-0.4	0.0	
0.3	0.5	M SAND	Silt	-	SM	well Graded	Dark Brown	Dry		SB2_0.5-0.6	0.0	Y
0.5	0.7	M SAND	F Sand	-	SW	well Graded	Black	Dry	*			
		EOB@	0.7m	End of	investigation							

Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Well Construction Details

Concrete:	-
Bentonite:	-
Sand:	-
Screen Interval:	-

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:
*Material is very light in mass and appears to be ash from either coal or timber.

Notes: Concrete; Bentonite; Sand; Well casing
DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									GRAVEL			Rock Fragments		
	CLAY		SILT		SAND								COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Ova
SB3/SV1	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18 10/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.03
☐ NDD		
☐ Hollow Auger		
☑ CROW BAR	-	0.0-0.03
☐		

Method of abandoning soil bore
- ☐ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☑ Install soil vapour point
- ☐ Backfilled with virgin material

	Plasticity	Range of Liquid Limit
Dark Grey / Grey / Light Grey / Dark Brown / Brown / Light Brown	Low	<35%
	Medium	>35% - <50%
	High	>50%

Particle Characteristics (Sand and Gravel Only): W Well Graded; P Poorly Graded; G Gap Graded; U Uniform

Moisture Content: Dry; Moist; Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency
0.0	0.03	ASPHALT							
0.03	0.7	VC SAND	C. Sand	M. gravel	SW	Well Graded	Dark Brown	Dry	
0.7	1.0	M SAND	S. Lt	M. gravel	SM	Well Graded	Dark Brown	Dry	
		EOB @ 1.0 Refusal to Hand Auger							

Sample ID	Bagged PID	Analysed/ QC sample ID
SB3_0.4-0.5	0.0	Y
SB_0.7-0.8	0.0	
SB8_0.9-1.0	0.0	Y

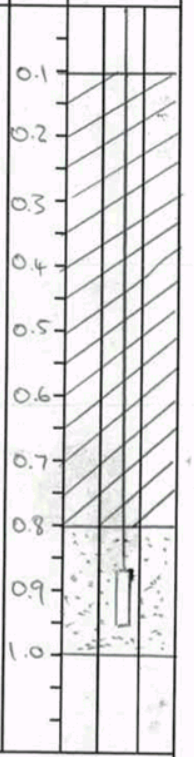
Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Vapour Point Well Construction Details

~~Concrete~~ Grout:	0.0 - 0.7
Bentonite:	0.7 - 0.8
Sand:	0.8 - 1.0
Screen Interval:	0.8 - 1.0

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction



Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes:
Concrete
Bentonite
Sand
Well casing
DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH: CLAY Fine	CLAY Coarse	SILT Fine	SILT Coarse	SAND V.fine	SAND Fine	SAND Med	SAND Coarse	SAND V.Coarse	GRAVEL Fine	GRAVEL Medium	GRAVEL Coarse	Rock Fragments: COBBLES	STONES	BOULDERS
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Oval
SB4	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.08-
☐ NDD		
☐ Hollow Auger		
☑ Crow BAR	-	0.0-0.08
☐		

Method of abandoning soil bore
- ☐ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

Dark Grey, Grey, Light Grey, Dark Brown, Brown, Light Brown

Plasticity	Range of Liquid Limit
Low	<35%
Medium	>35% - <50%
High	>50%

Particle Characteristics (Sand and Gravel Only): W Well Graded; P Poorly Graded; G Gap Graded; U Uniform

Moisture Content: Dry; Moist; Wet

Depth (mBGS) From	Depth (mBGS) To	Soil Classification: Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency	Sample ID	Bagged PID	Analysed/ QC sample ID
0.0	0.08	ASPHALT										
0.08	0.3	V.C SAND	C SAND	M.GRAVEL	SW	well Graded	Dark Brown	Dry	Fill	SB4_0.2-0.3	0.0	Y
0.3	1.1	M SAND	Clay	M.Gravel	SC	well grad. low Plas.	Dark Brown	Dry	Fill	SB4_0.3-0.4	0.0	
										SB4_0.4-0.5	0.0	
1.1	1.4	M.SAND	F.Sand	-	SW	well Graded	Dark Brown	Dry		SB4_1.3-1.4	0.0	Y
		EOB @	1.4M	end of	investigation							

Well Development: By; Date; Method; Initial DTW; Purge Volume; Post purge DTW; Estimated recharge rate:

Well Construction Details

Concrete:	-
Bentonite:	-
Sand:	-
Screen Interval:	-

Core/ Bagged PID; Water Level; mBGS; Graphical Well Construction

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes: Concrete; Bentonite; Sand; Well casing

DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									Rock Fragments					
	CLAY		SILT		SAND					GRAVEL			COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

Soil Bore ID:	Site Name:	North Hobart Ova'
SB5	Site Address:	1-5 Ryde Street, North Hobart
	Job No:	EMC1866

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Logged by: Alex Lovibond Date: 7/9/18

Drilling Method	Ø(mm)	Depth (mBGS)
☑ Hand Auger	130	0.1 -
☐ NDD		
☐ Hollow Auger		
☑ Crow Bar	-	0-0.1
☐		

Method of abandoning soil bore
- ☑ Backfill with drill cuttings and compact
- ☐ Resurface with concrete
- ☐ Install monitoring well
- ☐ Install soil vapour point
- ☐ Backfilled with virgin material

Dark Grey, Grey, Light Grey, Dark Brown, Brown, Light Brown

Plasticity	Range of Liquid Limit
Low	<35%
Medium	>35% - <50%
High	>50%

Particle Characteristics (Sand and Gravel Only)
- W Well Graded
- P Poorly Graded
- G Gap Graded
- U Uniform

Moisture Content: Dry, Moist, Wet

Depth (mBGS) From	Depth (mBGS) To	Dominant soil component	Descriptive soil component	Other minor soil component	USCS Group letters	Plactisity/ Particle (USDA) charateristics	Colour	Moisture (see field guide)	Consistency
0.0	0.1	ASPHALT							
0.1	0.4	VC SAND	C. Sand	M. gravel	SW	Well Graded	Dark Brown	DM	
0.4	0.6	M SAND	Silt	-	SM	well Graded	Pale Brown	DM	
		EOBQ	0.6m	end of investigation					

Sample ID	Bagged PID	Analysed/ QC sample ID
SB5_0.3-0.4	0.0	Y
SB5_0.5-0.6	0.0	Y

Core/ Bagged PID | Water Level | mBGS | Graphical Well Construction

Well Development

By:	
Date:	
Method:	
Initial DTW:	
Purge Volume:	
Post purge DTW:	
Estimated recharge rate:	

Well Construction Details

Concrete:	-
Bentonite:	-
Sand:	-
Screen Interval:	-

Notes:
mBGS: metres below ground surface
Ø(mm): diameter in millimetres
NDD: non destructive drilling

Comments:

Notes:
Concrete
Bentonite
Sand
Well casing
DTW: Depth to Water
mBTOC: metres below top of well casing

USDA	FINE EARTH									GRAVEL			Rock Fragments		
	CLAY		SILT		SAND								COBBLES	STONES	BOULDERS
	Fine	Coarse	Fine	Coarse	V.fine	Fine	Med	Coarse	V.Coarse	Fine	Medium	Coarse			
Max particle Size (mm)	0.0002	0.002	0.02	0.05	0.1	0.25	0.5	1	2	5	20	76	250	600	N/A

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STABILISED SOIL VAPOUR GAUGING LOG

Site Name:	North Hobart Oval	Date:	11/9/18
Site Address:	1-5 Ryde Street, North Hobart	Logged by:	Alex Lovibond
Job Number:	EMC1866		

Soil Vapour Point ID	Sample depth (m)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	LEL (%) (Octane) Methane	PID (ppm) (Isobutylene)	Sample Point Condition (rust, water in sample point cover, gatic cover, screws, gripper and rubber seal condition)	Comments
SV1_0.8-1.0	0.8-1.0	0.0	3.1	17.1	NG	NG	0.0	0.0	Good	-

Notes:

% Methane recorded by GA5000 Landfill Gas Meter considered unreliable in the presence of petroleum hydrocarbons. * Denotes meter intake connected to tail gas of purging meter and result should be interpreted with caution

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ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

FIELD RECORD: Soil Vapour Sampling

Site Name:	North Hobart Oval		
Site Address:	1-5 Ryde Street, North Hobart	Job #:	EMC1866
Person sampling:	Alex Lovibond	Date:	11/9/18

Sample Point ID: SV1 Sample Depth Range: 0.8-1.0 mBGS.

LEAK TESTING

TEST ONE - Sample Point Permeability (using syringe)

Time	Initial air volume in syringe	Final air volume in syringe	Test Result	Comments
11.52	00	60.0		
11.53	-	60.0	PASS	Point induced no measurable Vacuum

TEST TWO - Sample Train Shut-In Test (using syringe and pressure gauge)

Time	In-line pressure (kPa)	Test Result	Comments
11.54	-56		
11.55	-56	PASS	Train holds Vacuum

TEST THREE - Helium Shroud (over soil vapour bore surface seal)

Time	Concentration in Shroud (ppm)	Concentration in Tedlar	Test results: Result is considered a pass if the concentration within the tedlar bag is less than 10% of the concentration within the shroud
12.08	9×10^6	0×10^{-4}	PASS

Sample Point Purging

Time	Purge Rate (mL/min)	CH_4 (%)	CO_2 (%)	O_2 (%)	CO (%)	H_2S (%)	LEL METHANE (%)	PID * ppm	App. pressure kPa
12.15/0.00	300ml/min	0.0	0.0	21.0	NG	NG	0.0	0.0	0.0
0.30		0.0	3.1	17.1			0.0	0.0	0.0
0.30		0.0	3.1	17.1			0.0	0.0	0.0
0.45		0.0	3.1	17.1			0.0	0.0	0.0
0.60		0.0	3.1	17.0			0.0	0.0	0.0
75		0.0	3.0	17.0			0.0	0.0	0.0
90		0.0	3.1	17.1			0.0	0.0	0.0
105		0.0	3.1	17.0			0.0	0.0	0.0
120	↓	0.0	3.1	17.1	↓	↓	0.0	0.0	0.0

Vapour purging gas Meter used: GFM430 10380	Date of Calibration: 6/9/18
Helium meter used: Ion gascheck 14-01371	Date of Calibration: 22/8/2018
Sample tube type: □SS ☑Teflon □Nylon □.....	**Sample probe type:** ☑SS implant □SS wool □.....

SAMPLING

Time sampling begin: 12.30	Time sampling finished: 13.06
Initial pressure in suma canister(s): NA	Final pressure in suma canister(s): NA
Primary Sample Suma canister ID: NA	Duplicate / Split Sample suma canister ID: NA
Sampling Train ID: NA	Flow restrictor flow rate: NA

* Denotes field meter intake was connected to tail gas of purging meter and results should be interpreted with caution
Typical flow rate through GA5000 Landfill Gas Meter is 550ml/min
% Methane recorded by GA5000 Landfill Gas Meter considered unreliable in the presence of petroleum hydrocarbons
% LEL recorded by ImpactPRO (four gas meter) considered unreliable once the % of oxygen falls below 10%.
Flow rate during purging or sampling should not exceed 8inHg (27kPa) to prevent the desorption of petroleum hydrocarbons from soil (CRC CARE TR.23)

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

CALIBRATION CERTIFICATE

Make: Honeywell	Calibration Date: 2/7/18
Model: Impact Pro	Machine Reading: Calibration Due in 180 days
Serial No: ZEL1201176	Next Calibration Date: 28/12/18
Calibration Gas Supplier:	ThermoFisher Scientific
Calibration Gas ID:	Lot 440392, Cyl 18
Calibration Gas Expiry Date:	June 2019
Calibration Gas Composition:	ISOBUTYLENE 100 ppm C_4H_8

Calibration Method

Unit calibrated in accordance with MiniRAE Operating Instructions and Maintenance Manual (the 'user manual').

Method of calibration: Per section 4.4 of the user manual

Post calibration bump test reading of Calibration Gas

Isobutylene	Expected	Result
	100	100

Calibration completed by:
Simon Chislett
Competency: Gas Test Atmosphere, Course Code: MSAPMOHS217A

Signature

Date of Issue: 02/07/18

Air-Met Scientific P/L
7-11 Ceylon Street
Nunawading
Victoria 3131, Australia

Calibration Certificate

This document hereby certifies that this instrument detailed has been calibrated to the parameters listed below.

Certificate Print Date: 22 August, 2018
Calibration Date: 22 August, 2018
Next Calibration Due: 22 August, 2019

Call ID: 00221730

Job / SO Number: 232364

Customer: AMS Brisbane Rental **Type:** Misc

Model: Miscellaneous **Serial No:** 14-01371

Description: GasCheck 5000

Sensor	Date Code	Gas Bottle No.	Calibration Gas and Concentration	C.F	C.V	Instrument Readings Certified	Before / Span Res.	After
Helium Leak	//	1063ME	HELIUM - HIGH PURITY 99.9% (Leak 5E-4cc/sec)			ION S	5E-4cc/se	5E-4cc/se
	//							
	//							
	//							
	//							
	//							

Completed by: *Kyle Reardon* **Signed:**

Australian Standard Alarm Levels ☐

CF - Conversion Factor, CV Compensated Value
CV = CF * Span Gas

6/9/18

Gas Calibration Certificate

Instrument GFM430
Serial No. 10380
Sensors CH4, CO2, O2,H2S,CO

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
Pump	Operation		
	Filter		
	Flow		
	Valves, Diaphragm		
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	CH4	✓	
	CO2	✓	
	O2	✓	
	H2S	✓	
	CO	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version		
Datalogger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
Oxy		20.90%		Fresh Air	20.90%
CO2		40.0%	NIST	ME420	40.0%
CH4		60.0%	NIST	ME420	60.0%

Calibrated by: **Ariane Ventura**

Calibration date: **6/09/2018**

Next calibration due: **8/03/2019**

Appendix F

GIAP Search Results

EM&C executed GIAP search for area surrounding the Site indicating no registered nearby groundwater wells.

Appendix G

CRC CARE Soil Vapour Checklists L and K

CRCCARE

Checklist for Reviewing
Soil Vapour Data

em&c
ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Checklist for Reviewing Soil Vapour Data					
Report ID	**Report Description**				**Report Issue Date**
EN1805943	Soil Vapour Sampling - September 2018				17/09/18
	Acceptable		Acceptable, irragularities have been noted		Not acceptable

Sample Collection			
	Yes	**No**	**NA**
Active Soil Vapour Data			
Did the probe rod have an internal inert tube (SS, Teflon, nylon)?			
Comments: - Teflon			
Was the probe reused? If so was it adequately decontaminated between samples?			
Comments: - New stainless steel sample probes were used at the time of SV point installation.			
Were at least 3 dead volumes of the probe purged?			
Avoid excessive purging, unless field screening (O2, CO2, PID or FID and tracer gas) conducted to demonstrate absence of atmospheric air intrusion.			
Comments: See field screening logs attached.			
Did the field screening of PID, O2 and CO2 provide results consistent with those expected based on sample location (in relation to contamination), depth and soil type? Are the results consistent with the CSM (in particular parameters that relate to and support biodegradation processes)?			
Comments: Results align with expectations			
Were samples collected deep enough to minimise air infiltration?			
Comments: -			
Did it rain shortly before the sampling event?			
Soil vapour sampling should be avoided following significant precipitation			
Generally there is no consensus on how much rain can fall or how much time should elapse before taking samples. It depends on soil type, ground surface cover, amount of rain and previous soil moisture content. As a general guide sampling from wells in open ground (not beneath buildings or concrete pavement) should occur 3-7 days after 25mm rainfall has occurred within an approximate 24 hour time period.			
Comments: -			
Was a reliable method used to ensure the absence of atmospheric air leakage?			
Tracer compound used to demonstrate no leakage down or around probe and at all sample train fittings.			
Comments: Helium tracer compound utilised and analysed during field leak detection procedures as well as within laboratory analysed samples. See Soil Vapour QA/QC table attached to report.			
Were samples collected in appropriate containers for the chemicals of concern?			
Comments: -			
If canisters were used, was each canister certified clean or batch tested?			
Comments: Tedlar bags used			
Were dedicated flow controllers & sample trains used for each sample?			
It is not recommended that flow controllers and sample trains are re-used. Cleaning of these components in the field has been sown to be ineffective and the re-use of such equipment can result in cross-contamination.			
Comments: New sterile syringe used			

CRCCARE

Checklist for Reviewing
Soil Vapour Data

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Yes	No	NA
Were vacuum pumps used in the sample collection? If so, did the flow rate decrease because of resistance to flow?			
Comments: -			
Were excessive vacuums required to obtain a sample?			
>100 inches of H_20 (~8 inches of Hg) should be avoided			
Comments: -			
Were samples collected upstream of the vacuum pump (where used)?			
Comments: -			
Was the sample flow rate through the sorbent tubes monitored and reported throughout the sampling period?			
Comments: -			
For canisters, were samples stored at ambient air temperature?			
Comments: -			
For sorbent tubes, were these stored and shipped at <4°C			
Comments: -			
Were samples analysed within recommended holding times?			
Comments: -			
Passive Soil Vapour Programs			
Were method and trip blanks analysed?			
Needed to show absence of contaminants from lab or transportation back and forth to site			
Comments:			
Were samplers left in the ground for consistent and sufficient time?			
Generally a few days to 2 weeks (unless in an area with very high levels being sampled).			
Collected in same sequence as deployed			
Comments: -			
Were duplicate samples collected and how do they compare?			
Comments: Active sampling was conducted, however, the primary quality control duplicate leaked during transit to the laboratory meaning that it could not be analysed, see DQI checklist and QA/QC report			
Are data used appropriately?			
For what purpose?			
Were active soil vapour samples collected for comparison?			
How well do passive and active samples compare?			
Comments: Active samples taken, therefore this question is irrelevant.			
Could measured values be from infiltration of contaminated atmospheric air or from volatiles emitted from an overlying surface (e.g., asphalt, dirty soil)? (i.e. is there a chance of cross contamination from the environment?)			
Comments:			
Are relative concentrations of compounds detected consistent with expectations from other media (soil vapour, groundwater, bulk soil)?			
Comments: -			

CRCCARE

Checklist for Reviewing
Soil Vapour Data

em&c
ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Yes	No	NA
Were the passive samplers stored and shipped at <4°C			
Comments: -			
Were samples analysed within recommended holding times?			
Comments: -			
Sample Analysis			
The following questions should be asked when examining the analysis of any type of soil vapour sample: active or passive.			
Active and Passive Soil Vapour Samples			
What methods are being used? Can they detect the target compounds at the required levels of sensitivity?			
Comments: EP101 N5G and EP104			
Have the method required calibration standards been analysed?			
Comments: -			
Are the reported values within the documented calibration range of the instrument?			
Comments: -			
Are any compounds co-eluting?			
Comments: For GCMS analyses such as that carried out on these samples (EP101 codes), there are two situations and reporting protocols that may apply for co-eluting compounds, as follows; 1. When 2 (or more) compounds co-elute and cannot be separated on the basis of their MS fragmentation ions, they are reported together, for example in this assessment "meta- & para- Xylene" co-eluted and have been reported together. 2. When 2 (or more) compounds co-elute and they can be separated on the basis of their MS fragmentation ions without interference effects, they are reported as the individual components. In this situation there is generally no need to comment and data quality is not impacted For GC-FID or GC-TCD analyses (such as the gas analysis EP104), only the first of these two examples apply, as there is no MS spectrum. Any compounds that co-elute for this analysis will be reported together, which in this case has not occured.			

CRCCARE

Checklist for Reviewing Soil Vapour Data

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

		Yes	No	NA
Have the method required QA/QC samples been analysed (blanks, duplicates, etc.)				
Laboratory Duplicates	The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.			
Method Blank	The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination.			
Laboratory Control Spike	The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.			
Matrix Spike	The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.			
Are the calibration standards within method required holding times and traceable to a certified source?				
Comments: See attached documentation				
In what units are the data reported (µg/l, µg/m3, ppbv, ppmv)?				
Comments: $\mu g/m^3$				
For high concentrations, have large dilutions been performed and do these affect the interpretation of the results? (i.e. are the detection limits above the adopted screening values for the PHCs evaluated?)				
Comments: -				
Passive Soil Vapour Samples				
In addition to the analytical issues summarised above, the following issues should be examined with passive soil vapour samples:				
How are the samples desorbed from the collector?				
Comments:				
Is the desorption process quantitative and does it fractionate?				
Comments:				
What units are the data reported in (mass etc.)?				
Comments:				

CRCCARE

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments						
Report ID	**Report Description**				**Report Issue Date**	
EN1805943	Soil Vapour Sampling - September 2018				17/09/18	
	Acceptable		Acceptable, irragularities have been noted		Not acceptable	
Critical Issue and Assessment Steps						
					Relevant at Site?	Addressed in Report Section #
					Yes	**No**
Objectives of the PVI assessment						6
Comments:						
Determination of whether there is contamination present						
LNAPL						NA
Comments: Groundwater assessment has been excluded from the assessment						
Contaminated groundwater (dissolved phase)						NA
Comments: Groundwater assessment has been excluded from the assessment						
Contaminated Soil						9.2
Comments:						
If none of the above factors are relevant for the site - Site ruled out from needing further assessment as no relevant contamination present at site						
Development of Sufficient CSM (meets minimum requirements from Table 1 of PVI guideance)						
Source of contamination identified						3
Comments: Previous onsite and adjacent contaminating industry						
Nature and extent of contamination identified						9.2
Comments:						
Geology described						5.4
Comments:						
Hydrogeology described						5.5
Comments:						
Zone of influence established						9.2
Comments:						
Buildings and uses present						1
Comments:						
Buildings and uses proposed						1
Comments:						
Evaluation of whether short-term/acute risks are present						9.2
Comments:						
Auditor/regulator notified of short-term/acute risks and rectification actions developed						NA
Comments:						

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments

em&c ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Relevant at Site?		Addressed in Report Section #
	Yes	No	
Contamination in direct contact with existing or proposed building foundations			9
Comments:Sampled soil is will be in contact with proposed building footings			
Review and use of HSLs - Where applicable, are concentrations above HSLs			9.2
Comments:			
Review and use of screening distances - Where applicable is the distance between contamination and receptors/building foundation greater than the screening distances?			NA
Comments:			
Site ruled out from needing further assessment as vapour intrusion is not significant as determined through appropriate use of HSLs or screening distances (unless preferential pathways present)			
Preferential pathways present			NA
Comments:			
Where contamination is in contact with foundations, modelling of indoor air concentrations from seepage indicates potential risk			NA
Comments: Direct PVI assessment conducted in preference to modelling			
Where contamination is not in contact with foundations, modelling of indoor air concentrations from groundwater using J&E (or equivilent) indicates a potential risk			NA
Comments: soil vapour data gathered in preference to modelling			
Collection of vapour data			
Soil gas samples taken to provide evidence of level of risk			9.4
Comments:			
Soil gas samples collected from appropriate locations and depths			9.4
Comments:			
Soil gas samples collected from representative conditions			9.4
Comments: Soil vapour sample collected at a depth below the projected excavation extent, representing conditions directly below the proposed finished ground surface.			
Soil gas samples collected in accordance with Box 5.4 of PVI Guidance (also ref App K)			6
Comments: See SAQP			
Crawl space samples taken to provide evidence of level of risk			NA
Comments:			
Crawl space samples collected from appropriate locations and over appropriate period of time			NA
Comments:			
Crawl space samples collected in accordance with Box 5.5 of PVI guidance			NA
Comments:			
Indoor air samples taken to provide evidence of level of risk			NA
Comments:			
Air samples collected from appropriate locations and over appropriate period of time			NA
Comments:			

Checklist for Reporting Critical Aspects and Assessment Steps in PVI Assessments

ENVIRONMENTAL MANAGEMENT & CONSULTING PTY LTD

	Relevant at Site?		Addressed in Report Section #
	Yes	No	
Air samples collected in accordance with Box 5.5 of PVI guidance			NA
Comments:			
Evaluation of vapour data			
Is the data of suitable quality to use in the assessment (QA/QC evaluation)			9.5
Comments:			
Is there sufficient data for making robust conclusions			9.5
Comments:			

7.2.4 3 ERINDALE PLACE & 163 STRICKLAND AVENUE, SOUTH HOBART - DWELLING AND ASSOCIATED VEGETATION CLEARING PLN-18-493 - FILE REF: F19/1264

Address:	3 Erindale Place & 163 Strickland Avenue, South Hobart
Proposal:	Dwelling and Associated Vegetation Clearing
Expiry Date:	18 January 2019
Extension of Time:	Not applicable
Author:	Victoria Maxwell

RECOMMENDATION

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for dwelling and associated vegetation clearing at 3 Erindale Place & 163 Strickland Avenue, South Hobart for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GEN

The use and/or development must be substantially in accordance with the documents and drawings that comprise PLN-18-493 3 ERINDALE PLACE SOUTH HOBART TAS 7004 - Final Planning Documents except where modified below.

Reason for condition

To clarify the scope of the permit.

PLN s3

The title boundary shared between Council's neighbouring land and the applicant's property shall be clearly marked by the applicant on the ground before any works commence.

Reason for condition

To clarify the scope of the permit.

ENG sw4

The new storm water connection must be constructed and existing abandoned connections sealed by the Council at the owner's expense, prior to the first occupation.

Detailed engineering drawings must be submitted and approved, prior to commencement of work. The detailed engineering drawings must include:

1. **the location of the proposed connection; and**
2. **the size of the connection appropriate to satisfy the needs of the development.**

All work required by this condition must be undertaken in accordance with the approved detailed engineering drawings.

Advice:

- *The applicant is advised to submit detailed design drawings via a Council City Infrastructure Division application for a new stormwater connection. If detailed design to satisfy this condition is submitted via the planning condition endorsement process there may be fees associated with the assessment, and once approved the applicant will still need to submit an application for a new stormwater connection with Council City Infrastructure Division.*

- *Where building / plumbing approval is also required, it is recommended that documentation to satisfy this condition is submitted well before submitting documentation for building/plumbing approval. Failure to address planning condition requirements prior to submitting for building/plumbing approval may result in unexpected delays.*

Reason for condition

To ensure the site is drained adequately.

ENG 2b

Prior to the issue of any approval under the *Building Act 2016* or the commencement of works on site (whichever occurs first), a certified vehicle barrier design (including site plan with proposed location(s) of installation) prepared by a suitably qualified engineer, compliant with Australian Standard AS/NZS1170.1:2002, must be submitted to the Council.

Advice:

- *If the development's building approval includes the need for a Building Permit from the Council, the applicant is advised to submit detailed design of vehicular barrier as part of the Building Application. If the development's building approval is covered under Notifiable Work the applicant is advised to submit detailed design of vehicular barrier as a condition endorsement of the planning permit condition. Once the certification has been accepted, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).*

Reason for condition

To ensure the safety of users of the access driveway and parking module and compliance with the standard.

ENG 2c

Prior to the first occupation, vehicular barriers must be inspected by a qualified engineer and certification submitted to the Council confirming that the installed vehicular barriers comply with the certified design and Australian Standard AS/NZS1170.1:2002.

Advice:

- *Certification may be submitted to the Council as part of the* Building Act 2016 *approval process or via condition endorsement (see general advice on how to obtain condition endorsement).*

Reason for condition

To ensure the safety of users of the access driveway and parking module and compliance with the relevant standards.

ENG 1

Any damage to council infrastructure resulting from the implementation of this permit, must, at the discretion of the Council:

1. **Be met by the owner by way of reimbursement (cost of repair and reinstatement to be paid by the owner to the Council); or**
2. **Be repaired and reinstated by the owner to the satisfaction of Council.**

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strips, including if any, pre-existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENV 10

No native vegetation may be removed from 3 Erindale Place more than 16m from the southern edge of the dwelling, unless required for the installation of the sewer line.

Reason for condition

To ensure the use/development does not result in unnecessary or unacceptable loss of priority biodiversity values

ENV 15

All construction vehicles and machinery must be effectively cleaned of soil both before entering and before leaving the property.

Soil cleaned from construction vehicles and machinery must not be allowed, either directly or indirectly, to enter waterways or the Council's stormwater system.

Note: further information on effective measures for washdown can be found here.

Reason for condition

To minimise the spread of weeds and pathogens.

ENV 2

Sediment and erosion control measures, in accordance with an approved soil and water management plan (SWMP), must be installed prior to the commencement of work and maintained until such time as all disturbed areas have been stabilised and/or restored or sealed to the Council's satisfaction.

A SWMP must be submitted prior to the issue of any approval under the *Building Act 2016* or the commencement of work, whichever occurs first. The SWMP must be prepared in accordance with the Soil and Water Management on Building and Construction Sites fact sheets (Derwent Estuary Program, 2008), available here.

Particular attention must be given to managing erosion and sedimentation risk when establishing the bushfire hazard management area on the adjacent Council land.

All work required by this condition must be undertaken in accordance with the approved SWMP.

Advice: Once the SWMP has been approved, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Where building approval is also required, it is recommended that documentation for condition endorsement be submitted well before submitting documentation for building approval. Failure to address condition endorsement requirements prior to submitting for building approval may result in unexpected delays.

Reason for condition

To avoid the pollution and sedimentation of roads, drains and natural watercourses that could be caused by erosion and runoff from the development.

OPS 2

A Bushfire Hazard Management Area (BHMA) must be established on the Council reserve Strickland Avenue no. 5, as specified in the approved Bushfire Hazard Management Plan, prior to occupancy. All costs associated with the establishment of the BHMA will be borne by the applicant.

Upon establishment of the BHMA to the satisfaction of the Council, the Council will assume responsibility for the ongoing maintenance of the BHMA, as part of the urban firebreaks program.

Reason for condition

To ensure that the approved Bushfire Hazard Management Plan is implemented in a timely manner, and to the satisfaction of the Council, providing for the safety of inhabitants of the proposed dwelling.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit the Council's website for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

CONDITION ENDORSEMENT ENGINEERING

All engineering drawings required to be submitted and approved by this planning permit must be submitted to the City of Hobart as a CEP (Condition Endorsement) via the City's Online Service Development Portal. When lodging a CEP, please reference the PLN number of the associated Planning Application. Each CEP must also include an estimation of the cost of works shown on the submitted engineering drawings. Once that estimation has been confirmed by the City's Engineer, the following fees are payable for each CEP submitted and must be paid prior to the City of Hobart commencing assessment of the engineering drawings in each CEP:

Value of Building Works Approved by Planning Permit Fee:

- Up to $20,000: $150 per application.
- Over $20,000: 2% of the value of the works as assessed by the City's Engineer per assessment.

These fees are additional to building and plumbing fees charged under the Building and Plumbing Regulations.

Once the CEP is lodged via the Online Service Development Portal, if the value of building works approved by your planning permit is over $20,000, please contact the City's Development Engineer on 6238 2715 to confirm the estimation of the cost of works shown on the submitted engineering drawings has been accepted.

Once confirmed, pleased call one of the City's Customer Service Officers on 6238 2190 to make payment, quoting the reference number (ie. CEP number) of the Condition Endorsement you have lodged. Once payment is made, your engineering drawings will be assessed.

BUILDING PERMIT

You may need building approval in accordance with the *Building Act 2016.* Click here for more information.

This is a Discretionary Planning Permit issued in accordance with section 57 of the *Land Use Planning and Approvals Act 1993*.

PLUMBING PERMIT

You may need plumbing approval in accordance with the *Building Act 2016*, *Building Regulations 2016* and the National Construction Code. Click here for more information.

OCCUPATION OF THE PUBLIC HIGHWAY

You may require a Permit to Open Up and Temporarily Occupy a Highway (for work in the road reserve). Click here for more information.

NEW SERVICE CONNECTION

Please contact the Hobart City Council's City Infrastructure Division to initiate the application process for your new stormwater connection.

STORM WATER

Please note that in addition to a building and/or plumbing permit, development must be in accordance with the Hobart City Council's Hydraulic Services By law. Click here for more information.

WORK WITHIN THE HIGHWAY RESERVATION

Please note development must be in accordance with the Hobart City Council's Highways By law. Click here for more information.

FEES AND CHARGES

Click here for information on the Council's fees and charges.

DIAL BEFORE YOU DIG

Click here for dial before you dig information.

PART 5 AGREEMENT

Please note that the owner(s) of this property are subject to a Part 5 Agreement with
Hobart City Council (C935042) that requires the owner(s) to:

- Implement the approved Bushfire Management Plan in relation to the land
(superseded);

- Refrain from removing any tree on the land which has a circumference of more than 400mm measured one metre above the adjacent ground level unless that tree is within three metres of the outer wall of any building on the land that is approved by the Planning Authority or removal of the tree is necessary for safety reasons as determined and approved in writing by the Planning Authority (trees proposed to be removed on plans approved);

- Ensure no habitable building development occurs below the High Terrace

- Embankment Area on the land (proposal complies); and

- Ensure that any dwelling or fence on the land is constructed in accordance with the guidelines and recommendations of the document *Minimising the Swift Parrot Collision Threat: Guidelines and recommendations for parrot-safe building design*.

With regard to compliance with the swift parrot collision guidelines, it is recommended that the following occurs to avoid breaching the Agreement:

- low-reflectivity glass (<10% visible light reflectivity) is used wherever possible; and

- the clear glass balustrades are treated in accordance with the guidelines (frosted, tinted, patterned etc) or substituted with an alternative balustrade design (e.g. tension wire).

Copies of the Part 5 Agreement are available from The LIST website (www.thelist.tas.gov.au) via the 'Scanned Dealings' section.

COUNCIL RESERVES

This permit does not authorise any works (other than for bushfire hazard management or stormwater connection as approved) on the adjoining Council land. Any act that causes, or is likely to cause, damage to Council's land may be in breach of Council's Public Spaces By-law and penalties may apply. The by-law is available here.

Attachment A:	PLN-18-493 - 3 ERINDALE PLACE SOUTH HOBART TAS 7004 - Planning Committee or Delegated Report ⇩
Attachment B:	PLN-18-493 - 3 ERINDALE PLACE SOUTH HOBART TAS 7004 - CPC Agenda Documents ⇩
Attachment C:	PLN-18-493 - 3 ERINDALE PLACE SOUTH HOBART TAS 7004 - Planning Referral Officer Environmental Development Planner Report ⇩
Attachment D:	PLN-18-493 - 3 ERINDALE PLACE SOUTH HOBART TAS 7004 - CPC Supporting Documents (Supporting information)

City of HOBART

APPLICATION UNDER HOBART INTERIM PLANNING SCHEME 2015

Type of Report:	Committee
Council:	14 January 2019
Expiry Date:	18 January 2019
Application No:	PLN-18-493
Address:	3 ERINDALE PLACE , SOUTH HOBART 163 STRICKLAND AVENUE , SOUTH HOBART
Applicant:	Danny MacGregor 3 ELDON STREET
Proposal:	Dwelling and Associated Vegetation Clearing
Representations:	No representations were received during the advertising period.
Performance criteria:	Part D 10.4.2 P3 - Building Envelope in the General Residential zone Part E 10.7.1 P1 - Building and works in the Biodiversity Areas code Part E 11.7.1 P1 - Building and works in the Waterways and Coastal Protection Areas code

1. Executive Summary

1.1 Planning approval is sought for a dwelling at 3 Erindale Place, South Hobart and works on Council-owned 163 Strickland Avenue, South Hobart. As the proposal involves Council property, it is to be determined by full Council.

1.2 More specifically the proposal is for:

- A two storey dwelling in the northern half of the site with a maximum height of 8.4m and a total floor area of 235m2.
- The upper floor is comprised of a double garage, master bedroom with ensuite, laundry, and an open plan kitchen, dining and living area.
- The lower floor is comprised of two bedrooms, one bathroom and a living area.
- Clearing of vegetation on the site and on the adjoining Council reserve at 163 Strickland Avenue for bushfire hazard protection measures.

1.3 The proposal relies on performance criteria to satisfy the following standards and codes:

1.3.1 Zone Development Standards - Building Envelope
1.3.2 Biodiversity Code

1.3.3 Waterway and Coastal Protection Code
1.3.4 Inundation Prone Areas Code

1.4 No representations were received during the statutory advertising period between 14 and 31 December 2018.

1.5 The proposal is recommended for approval subject to conditions.

1.6 The final decision is delegated to full Council.

2. Site Detail

2.1 The site is an internal lot located at the western end of Erindale Place, some 40m from the junction of Woodlyn Court and Erindale Place, South Hobart. The site is a currently vacant and south east facing lot, sloping down to a tributary of the Hobart Rivulet, which traverses the lot some 16m from the building site. The lot adjoins an existing residential dwelling to the north, with a vacant residential lot to the east and a pocket of native bushland owned and managed by Council to the south and west.

Figure 1: location of the subject site at 3 Erindale Place, South Hobart (outlined in blue).

The site falls some 11m over a distance of approximately 60m. Figure 2 below shows the location of the tributary and Hobart Rivulet on the southern section of the lot. The property contains Eucalypt species, linking to the Council owned land to the west, although the building site is partially cleared.

Figure 2: the subject site at 3 Erindale Place, South Hobart (outlined in blue).

3. Proposal

3.1 Planning approval is sought for a Single Dwelling at 3 Erindale Place, South Hobart and associated vegetation clearing on Council owned land at 163 Strickland Avenue, South Hobart.

3.2 More specifically the proposal is for:

- A two storey dwelling in the northern half of the site with a maximum height of 8.4m and a total floor area of 235m^2.
- The upper floor is comprised of a double garage, master bedroom with ensuite, laundry, and an open plan kitchen, dining and living area.
- The lower floor is comprised of two bedrooms, one bathroom and a living area.
- The dwelling is cut into the hill slightly and faces south.
- Clearing of vegetation on the site and 8m into adjoining Council reserve at 163 Strickland Avenue for bushfire hazard protection measures.

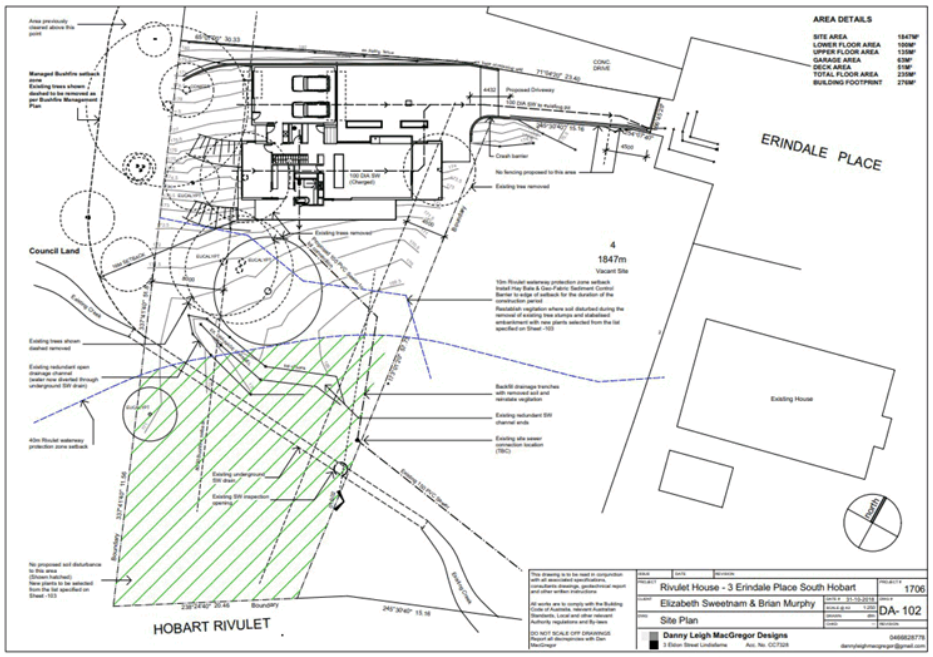


Figure 3: Proposed Site Plan (DLM Designs, 2018)

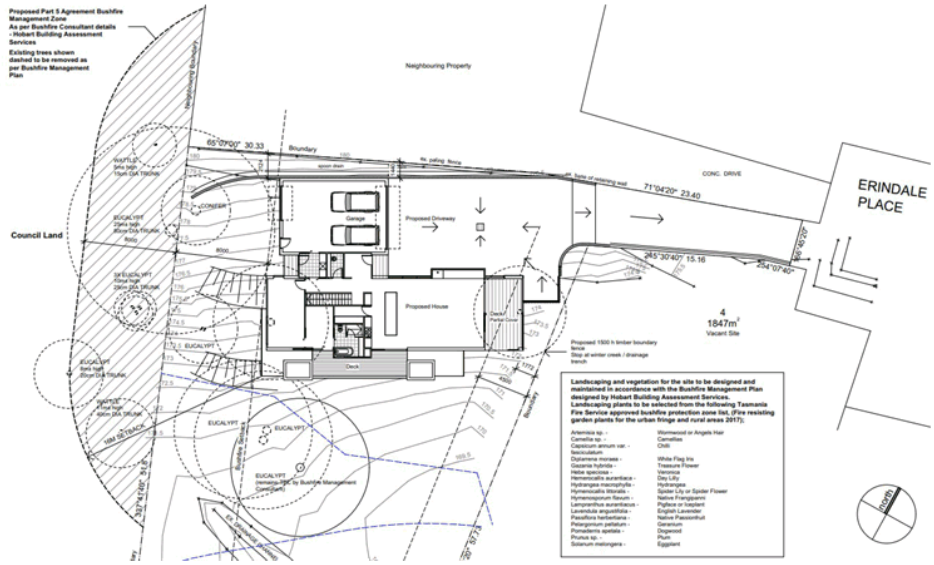


Figure 4: Proposed Fire Setback Plan (DLM Designs, 2018)

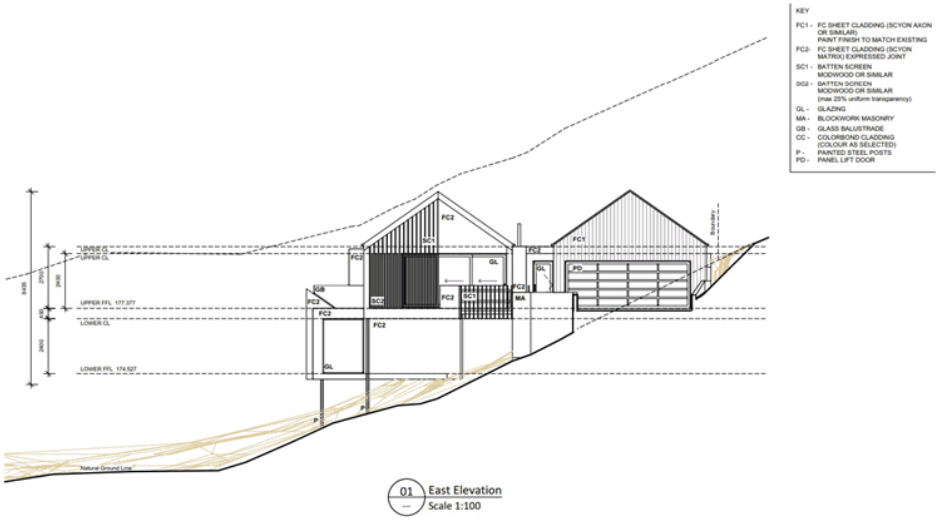


Figure 5: Proposed East Elevation (DLM Designs, 2018)

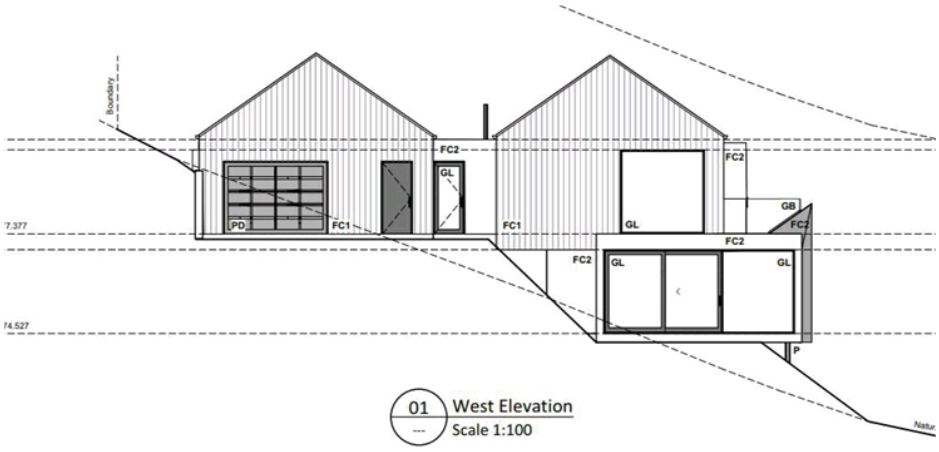


Figure 6: Proposed Western Elevation - view from Council reserve (DLM Designs, 2018)

4. Background

4.1 The subject lot was formed as part of subdivision permit PLN-08-01362-01, which required the owner to enter into a Part 5 Agreement with the Council, pursuant to the Land Use Planning and Approvals Act 1993 to manage the land in accordance with the approved Bushfire Management Plan. This Part 5 Agreement was entered into on 5 October 2009 and forms part of the title documentation submitted with this application.

5. Concerns raised by representors

5.1 No representations were received during the statutory advertising period between 14 and 31 December 2018. The advertising period was extended under S57 5AA of the Land Use Planning and Approvals Act 1993.

6. Assessment

6.1 The *Hobart Interim Planning Scheme 2015* is a performance based planning scheme. To meet an applicable standard, a proposal must demonstrate compliance with either an acceptable solution or a performance criterion. Where a proposal complies with a standard by relying on one or more performance criteria, the Council may approve or refuse the proposal on that basis. The ability to approve or refuse the proposal relates only to the performance criteria relied on.

6.2 The site is located within the General Residential Zone of the *Hobart Interim Planning Scheme 2015*.

6.3 The subject site is a vacant lot, and as such there is no existing use. The proposed use is a single dwelling. The proposed use is a no permit required use in the zone.

6.4 The proposal has been assessed against:

6.4.1 Part D - 10 General Residential Zone

6.4.2 E6.0 Parking and Access Code

6.4.3 E7.0 Stormwater Management Code

6.4.4 E10.0 Biodiversity Code

6.4.5 E11.0 Waterway and Coastal Protection Code

6.4.6 E15.0 Inundation Prone Areas Code

6.5 The proposal relies on the following performance criteria to comply with the applicable standards:

6.5.1 General Residential Zone - Building Envelope – Part D 10.4.2 P3

6.5.2 Biodiversity Code - Buildings and Works – Part E 10.7.1 P1

6.5.3 Waterway and Coastal Protection Code - Buildings and Works – Part E 11.7.1 P1

6.6 Each performance criterion is assessed below.

6.7 General Residential zone - Part D 10.4.2 - Building Envelope

6.7.1 The acceptable solution at clause 10.4.2.A3 requires buildings to be sited within a prescribed building envelope, which in this instance requires a 4.5m setback to the eastern lot boundary, excluding the access leg.

6.7.2 The proposal includes an eastern boundary setback of 1.77m, excluding the access leg.

6.7.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.7.4 The performance criterion at clause 10.4.2.P3 provides as follows:

The siting and scale of a dwelling must:

(a) not cause unreasonable loss of amenity by:

(i) reduction in sunlight to a habitable room (other than a bedroom) of a dwelling on an adjoining lot; or
(ii) overshadowing the private open space of a dwelling on an adjoining lot; or
(iii) overshadowing of an adjoining vacant lot; or
(iv) visual impacts caused by the apparent scale, bulk or proportions of the dwelling when viewed from an adjoining lot; and

(b) provide separation between dwellings on adjoining lots that is compatible with that prevailing in the surrounding area.

6.7.5 The dwelling adjoins two residential lots and the Council owned reserve within the Open Space zone. The adjoining residential lot to the east is vacant. The adjoining residential lot to the north contains a single dwelling. Adjoining open space lots to the south and west are natural bushland.

The dwelling is sited in the northern half of the lot to avoid site constraints including the need for buffer distances from Hobart Rivulet. The dwelling has also been sited within a slight cutting and has been designed to the slope of the land in order to resemble a single storey split level

structure. When viewed from adjoining lots, the siting and building design, including articulation, transitioning of height and materials pallet will serve to reduce the visual impact of the dwelling by reducing the apparent height and bulk.

Shadow diagrams indicate that significant overshadowing of the adjoining eastern lot currently occurs due to the topographic features of the spur along Old Farm Road. The increased overshadowing created by the proposed dwelling is not substantially more than existing on 21st June. Notwithstanding this, given that more than 3 hours of sunlight will still be available to all adjoining lots, overshadowing is considered to be minimal. The overshadowing is a result of the need to locate the building in the northern half of the lot to avoid site constraints around the watercourse within the lower section of the site.

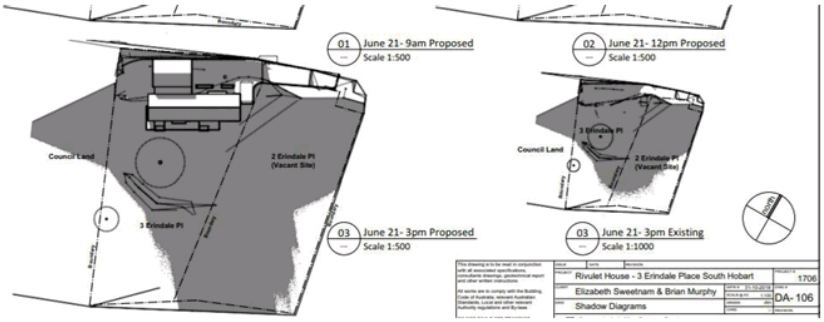


Figure 7: Shadow diagrams - 3pm 21st June Existing (right) and Proposed (DLM Designs, 2018)

Separation distances between dwellings in the surrounding area is variable. Dwellings at 4 and 5 Erindale Place are separated by approximately 8m. Dwellings at 5 and 6 Erindale Place are separated by approximately 7m. Dwellings at 1 Erindale Place and 2 Woodlyn Court are separated by approximately 2.5m. The adjoining residential lot to the north of the site contains an existing dwelling.

Figure 8: Surrounding development (Geo Cortex, 2018)

The proposed development will achieve approximately 15m separation distance from the existing dwelling to the north. Number 2 Erindale Place, the adjoining residential lot to the east, is vacant. The proposed development is set back approximately 2.5m from that mutual boundary. The proposed separation distances are therefore generally consistent with those prevailing in the area.

6.7.6 The proposal complies with the performance criterion.

6.8 Biodiversity Code - Part E 10.7.1 P1 - Buildings and Works

6.8.1 The acceptable solution at clause 10.7.1.A1 requires clearing of vegetation to be within a defined building area on a plan of subdivision. The adjacent Council land to the west is within a Biodiversity Protection Area and modification of the vegetation on that is land is proposed to establish a bushfire hazard management area. The residential lot is not within a Biodiversity Protection Area.

6.8.2 Therefore the proposal includes clearing of vegetation that is not within a defined building area on a plan of subdivision.

6.8.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.8.4 The relevant performance criterion at clause 10.7.1.P1 provides as follows:

Clearance and conversion or disturbance must satisfy the following:

(b) if moderate priority biodiversity values:

(i) development is designed and located to minimise impacts, having regard to constraints such as topography or land hazard and the particular requirements of the development;
(ii) impacts resulting from bushfire hazard management measures are minimised as far as reasonably practicable through siting and fire-resistant design of habitable buildings;
(iii) remaining moderate priority biodiversity values on the site are retained and improved through implementation of current best practice mitigation strategies and ongoing management measures designed to protect the integrity of these values;

6.8.5 The Council's Environmental Development Planner has provided the following assessment (the officer's full assessment is attached to this report):

The submitted documents indicate that twelve trees are proposed to be removed. These include six small *Eucalyptus obliqua* (stringybark) and *Acacia dealbata* (silver wattle) and one large *Eucalyptus obliqua* within the biodiversity protection area. Understorey modification is also proposed for the bushfire hazard management area on the adjacent Council land. Three *Eucalyptus globulus* (blue gum) would be removed from the residential lot.

A natural values assessment was submitted with the application. The main findings of the assessment were:

- The vegetation at 3 Erindale Place is best classified as urban areas (TASVEG code: FUR) because of the high level of disturbance, with some parts marginally classifiable as a wet sclerophyll mapping unit, either '*Eucalyptus globulus* wet forest' (WGL) or *'Eucalyptus obliqua* forest with broad-leaf shrubs' (WOB).

- The adjacent Council-owner land to the west of the title supports wet sclerophyll forest that is transitional between '*Eucalyptus globulus* wet forest' (WGL) or *'Eucalyptus obliqua* forest with broad-leaf shrubs' (WOB), with perhaps a slight favour to WGL over WOB because of a few larger canopy trees of *Eucalyptus globulus*.

- Database information and site assessment did not indicate the

presence of any flora or fauna species listed as threatened.

- Database information (and site assessment did not indicate the presence of any fauna species listed as threatened.

- The lot provides potential habitat for a suite of threatened species, however it is not considered significant habitat as it is for ubiquitous and widespread species such as the Tasmanian devil, spotted-tailed quoll, eastern quoll, eastern barred bandicoot, grey goshawk. The absence of hollow-bearing trees precludes the site providing potential nesting habitat for several species (e.g. masked owl, swift parrot). The highly modified understorey and absence of key indicator species precludes the presence of threatened invertebrate species (e.g. chaostola skipper, ammonite snail). The site may be marginally suitable for the Mt Mangana stag beetle (within range) but the absence of large logs (presumably due to fire history and time since last fire) suggests the species is highly unlikely to be present.

- The lot (and adjacent area) does support *Eucalyptus globulus* (blue gum), which is recognised as a foraging resource for the swift parrot. The contribution made by individual trees, patches and larger areas of blue gums to the overall foraging resource for the swift parrot would vary considerably between years and within seasons.

The report concluded that the impact of the proposed development on biodiversity values would be low and made no recommendations for mitigation measures.

The relevant Code standards are under clause E10.7.1 'Buildings and Works'. The proposal does not comply with acceptable solution A1 because the vegetation community affected (*'Eucalyptus globulus* wet forest') is specified as being a 'moderate' priority biodiversity value in Table E10.1 of the Code. In addition, the submitted natural values assessment classifies the vegetation as being of 'moderate' priority as potential foraging habitat for swift parrots. Despite this, it is important to note that no *Eucalyptus globulus* would be removed from the land within the Biodiversity Protection Area (the adjacent Council land) with all blue gums proposed for removal being located on the residential lot.

The proposed dwelling has been sited in the north-eastern corner of the lot reducing the development's impact upon the native vegetation to the south and west. The dwelling would be constructed to BAL-29 specification reducing the extent of the bushfire hazard management

area. The degree of tree clearing is considered reasonable given their proximity to the proposed dwelling.

The remaining vegetation on the Council land is in relatively good condition and will be managed by Council.

6.8.6 The proposal complies with the performance criterion.

6.9 Wetlands and Coastal Protection code - Part E 11.7.1 P1 - Buildings and Works

6.9.1 The acceptable solution at clause 11.7.1.A1 requires works within a waterway and coastal protection area to be within a building area on a plan of subdivision.

6.9.2 The proposal includes works within the waterway protection area that are not within a building area on a plan of subdivision.

6.9.3 The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.9.4 The performance criterion at clause 11.7.1.P1 provides as follows:

Building and works within a Waterway and Coastal Protection Area must satisfy all of the following:

(a) avoid or mitigate impact on natural values;

(b) mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values;

(c) avoid or mitigate impacts on riparian or littoral vegetation;

(d) maintain natural streambank and streambed condition, (where it exists);

(e) maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation;

(f) avoid significantly impeding natural flow and drainage;

(g) maintain fish passage (where applicable);

(h) avoid landfilling of wetlands;

(i) works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.

6.9.5 The Council's Environmental Development Planner has provided the following assessment (the officer's full assessment is attached to this report):

Several *Eucalyptus globulus* would be removed from within the WPA, however this is required for the dwelling's bushfire hazard management area, being so close to the proposed dwelling. The Hazard Management Area (HMA) shown on the submitted Bushfire Hazard Management Plan (BHMP) does, however, extend to the southern boundary of the lot which is in excess of what is required under AS3959 (16m). It is therefore recommended that a condition be applied to any permit granted prohibiting the removal of native vegetation beyond the required 16m HMA (except where required to install the sewer line).

The drainage channel supports few natural values and carries little flow. No significant impacts on natural values are expected.

6.9.6 The proposal complies with the performance criterion.

7. Discussion

7.1 Planning approval is sought for a Dwelling at 3 Erindale Place, South Hobart.

7.2 The application was advertised and no representations were received.

7.3 The Council's Environmental Development Planner has provided additional comments as follows:

The owner(s) of this property are subject to a Part 5 Agreement with Hobart City Council (C935042) that requires the owner(s) to:

- Implement the approved Bushfire Management Plan in relation to the land;
- Refrain from removing any tree on the land which has a circumference of more than 400mm measured one metre above the adjacent ground level unless that tree is within three metres of the outer wall of any building on the land that is approved by the Planning Authority or removal of the tree is necessary for

safety reasons as determined and approved in writing by the Planning Authority;

- Ensure no habitable building development occurs below the High Terrace Embankment Area on the land; and

- Ensure that any dwelling or fence on the land is constructed in accordance with the guidelines and recommendations of the document Minimising the Swift Parrot Collision Threat: Guidelines and recommendations for parrot-safe building design.

The BHMP approved for the subdivision is out of date and can no longer be used to satisfy the Building Regulations 2016. An alternative certified BHMP was submitted with the application.

Several trees on the lot with a trunk diameter exceeding 400mm are proposed to be removed. The removal of these is considered necessary to establish an effective bushfire hazard management area as they are close, or within, the proposed building footprint.

The proposed building would be above the high terrace embankment.

The proposed dwelling design is largely consistent with the swift parrot collision guidelines, however a glass balustrade is proposed for the upper level deck.

Commentary regarding bird-strike risk was included in the submitted natural values report. The report states the following:

The elevation-by-elevation and window-by-window analysis of the risk of window-strike by birds (particularly the swift parrot) has demonstrated a generally low risk, and only minor mitigation is recommended (i.e. low reflectance glass on some windows only).

Advice is recommended for any permit granted recommending the use of low-reflectivity glazing and substituting or treating any clear glass balustrades to ensure compliance with the Agreement.

7.4 The proposal has been assessed against the relevant provisions of the planning scheme and is considered to perform well.

7.5 The proposal has been assessed by other Council officers, including the Council's Development Engineer, Environmental Development Planner, and Parks Planner. The officers have raised no objection to the proposal, subject to conditions.

7.6 The proposal is recommended for approval.

8. Conclusion

8.1 The proposed Dwelling at 3 Erindale Place, South Hobart satisfies the relevant provisions of the *Hobart Interim Planning Scheme 2015*, and as such is recommended for approval.

9. Recommendations

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for Dwelling at 3 Erindale Place, South Hobart. for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GEN

The use and/or development must be substantially in accordance with the documents and drawings that comprise PLN-18-493 3 ERINDALE PLACE SOUTH HOBART TAS 7004 - Final Planning Documents except where modified below.

Reason for condition

To clarify the scope of the permit.

PLN s3

The title boundary shared between Council's neighbouring land and the applicant's property shall be clearly marked by the applicant on the ground before any works commence.

Reason for conditions:

To clarify the scope of the permit.

ENG sw4

The new storm water connection must be constructed and existing abandoned connections sealed by the Council at the owner's expense, prior to the first occupation.

Detailed engineering drawings must be submitted and approved, prior to commencement of work. The detailed engineering drawings must include:

1. **the location of the proposed connection; and**
2. **the size of the connection appropriate to satisfy the needs of the development.**

All work required by this condition must be undertaken in accordance with the

approved detailed engineering drawings.

Advice:

- *The applicant is advised to submit detailed design drawings via a Council City Infrastructure Division application for a new stormwater connection. If detailed design to satisfy this condition is submitted via the planning condition endorsement process there may be fees associated with the assessment, and once approved the applicant will still need to submit an application for a new stormwater connection with Council City Infrastructure Division.*
- *Where building / plumbing approval is also required, it is recommended that documentation to satisfy this condition is submitted well before submitting documentation for building/plumbing approval. Failure to address planning condition requirements prior to submitting for building/plumbing approval may result in unexpected delays.*

Reason for condition

To ensure the site is drained adequately.

ENG 2b

Prior to the issue of any approval under the *Building Act 2016* or the commencement of works on site (whichever occurs first), a certified vehicle barrier design (including site plan with proposed location(s) of installation) prepared by a suitably qualified engineer, compliant with Australian Standard AS/NZS1170.1:2002, must be submitted to Council.

Advice:

- *If the development's building approval includes the need for a Building Permit from Council, the applicant is advised to submit detailed design of vehicular barrier as part of the Building Application.*
  If the development's building approval is covered under Notifiable Work the applicant is advised to submit detailed design of vehicular barrier as a condition endorsement of the planning permit condition. Once the certification has been accepted, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure the safety of users of the access driveway and parking module and compliance with the standard.

ENG 2c

Prior to the first occupation, vehicular barriers must be inspected by a qualified engineer and certification submitted to the Council confirming that the installed vehicular barriers comply with the certified design and Australian Standard AS/NZS1170.1:2002.

Advice:

- *Certification may be submitted to the Council as part of the Building Act 2016 approval process or via condition endorsement (see general advice on how to obtain condition endorsement)*

Reason for condition

To ensure the safety of users of the access driveway and parking module and compliance with the relevant standards.

ENG 1

Any damage to council infrastructure resulting from the implementation of this permit, must, at the discretion of council:

1. **Be met by the owner by way of reimbursement (cost of repair and reinstatement to be paid by the owner to council); or**
2. **Be repaired and reinstated by the owner to the satisfaction of Council.**

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strips, including if any, pre-existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENV 10

No native vegetation may be removed from 3 Erindale Place more than 16m from the southern edge of the dwelling, unless required for the installation of the sewer line.

Reason for condition

To ensure the use/development does not result in unnecessary or unacceptable loss of priority biodiversity values

ENV 15

All construction vehicles and machinery must be effectively cleaned of soil both before entering and before leaving the property.

Soil cleaned from construction vehicles and machinery must not be allowed, either directly or indirectly, to enter waterways or the Council's stomwater system.

Note: further information on effective measures for washdown can be found here.

Reason for condition

To minimise the spread of weeds and pathogens.

ENV 2

Sediment and erosion control measures, in accordance with an approved soil and water management plan (SWMP), must be installed prior to the commencement of work and maintained until such time as all disturbed areas have been stabilised and/or restored or sealed to the Council's satisfaction.

A SWMP must be submitted prior to the issue of any approval under the Building Act 2016 or the commencement of work, whichever occurs first. The SWMP must be prepared in accordance with the Soil and Water Management on Building and Construction Sites fact sheets (Derwent Estuary Program, 2008), available here.

Particular attention must be given to managing erosion and sedimentation risk when establishing the bushfire hazard management area on the adjacent Council land.

All work required by this condition must be undertaken in accordance with the approved SWMP.

Advice: Once the SWMP has been approved, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Where building approval is also required, it is recommended that documentation for condition endorsement be submitted well before submitting documentation for building approval. Failure to address condition endorsement requirements prior to submitting for building approval may result in unexpected delays.

Reason for Condition

To avoid the pollution and sedimentation of roads, drains and natural watercourses that could be caused by erosion and runoff from the development.

OPS 2

A Bushfire Hazard Management Area (BHMA) must be established on the Council reserve Strickland Avenue no. 5, as specified in the approved Bushfire Hazard Management Plan, prior to occupancy. All costs associated with the establishment of the BHMA will be borne by the applicant.

Upon establishment of the BHMA to the satisfaction of the Council, the Council will assume responsibility for the ongoing maintenance of the BHMA, as part of the urban firebreaks program.

Reason for condition

To ensure that the approved Bushfire Hazard Management Plan is implemented in a timely manner, and to the satisfaction of the Council, providing for the safety of inhabitants of the proposed dwelling.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit the Council's website for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

CONDITION ENDORSEMENT ENGINEERING

All engineering drawings required to be submitted and approved by this planning permit must be submitted to the City of Hobart as a CEP (Condition Endorsement) via the City's Online Service Development Portal. When lodging a CEP, please reference the PLN number of the associated Planning Application. Each CEP must also include an estimation of the cost of works shown on the submitted engineering drawings. Once that estimation has been confirmed by the City's Engineer, the following fees are payable for each CEP submitted and must be paid prior to the City of Hobart commencing assessment of the engineering drawings in each CEP:

Value of Building Works Approved by Planning Permit Fee:

- Up to $20,000: $150 per application.
- Over $20,000: 2% of the value of the works as assessed by the City's Engineer per assessment.

These fees are additional to building and plumbing fees charged under the Building and Plumbing Regulations.

Once the CEP is lodged via the Online Service Development Portal, if the value of building works approved by your planning permit is over $20,000, please contact the City's Development Engineer on 6238 2715 to confirm the estimation of the cost of works shown on the submitted engineering drawings has been accepted.

Once confirmed, pleased call one of the City's Customer Service Officers on 6238 2190 to make payment, quoting the reference number (ie. CEP number) of the Condition Endorsement you have lodged. Once payment is made, your engineering drawings will be assessed.

BUILDING PERMIT

You may need building approval in accordance with the *Building Act 2016*. Click here for more information.

This is a Discretionary Planning Permit issued in accordance with section 57 of the *Land Use Planning and Approvals Act 1993*.

PLUMBING PERMIT

You may need plumbing approval in accordance with the *Building Act 2016*, *Building Regulations 2016* and the National Construction Code. Click here for more information.

OCCUPATION OF THE PUBLIC HIGHWAY

You may require a Permit to Open Up and Temporarily Occupy a Highway (for work in the road reserve). Click here for more information.

NEW SERVICE CONNECTION

Please contact the Hobart City Council's City Infrastructure Division to initiate the application process for your new stormwater connection.

STORM WATER

Please note that in addition to a building and/or plumbing permit, development must be in accordance with the Hobart City Council's Hydraulic Services By law. Click here for more information.

WORK WITHIN THE HIGHWAY RESERVATION

Please note development must be in accordance with the Hobart City Council's Highways By law. Click here for more information.

FEES AND CHARGES

Click here for information on the Council's fees and charges.

DIAL BEFORE YOU DIG

Click here for dial before you dig information.

PART 5 AGREEMENT

Please note that the owner(s) of this property are subject to a Part 5 Agreement with Hobart City Council (C935042) that requires the owner(s) to:

- Implement the approved Bushfire Management Plan in relation to the land (superseded);
- Refrain from removing any tree on the land which has a circumference of more than 400mm measured one metre above the adjacent ground level unless that tree is within three metres of the outer wall of any building on the land that is approved by the Planning Authority or removal of the tree is necessary for safety reasons as determined and approved in writing by the Planning Authority (trees proposed to be removed on plans approved);
- Ensure no habitable building development occurs below the High Terrace Embankment Area on the land (proposal complies); and

- Ensure that any dwelling or fence on the land is constructed in accordance with the guidelines and recommendations of the document *Minimising the Swift Parrot Collision Threat: Guidelines and recommendations for parrot-safe building design*.

With regard to compliance with the swift parrot collision guidelines, it is recommended that the following occurs to avoid breaching the Agreement:

- low-reflectivity glass (<10% visible light reflectivity) is used wherever possible; and
- the clear glass balustrades are treated in accordance with the guidelines (frosted, tinted, patterned etc) or substituted with an alternative balustrade design (e.g. tension wire).

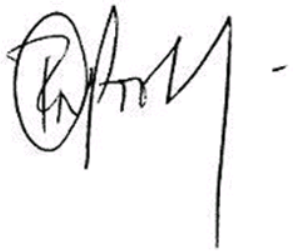
Copies of the Part 5 Agreement are available from The LIST website (www.thelist.tas.gov.au) via the 'Scanned Dealings' section.

COUNCIL RESERVES

This permit does not authorise any works (other than for bushfire hazard management or stormwater connection as approved) on the adjoining Council land. Any act that causes, or is likely to cause, damage to Council's land may be in breach of Council's Public Spaces By-law and penalties may apply. The by-law is available here.

(Victoria Maxwell)

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.



(Rohan Probert)
Manager Development Appraisal

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

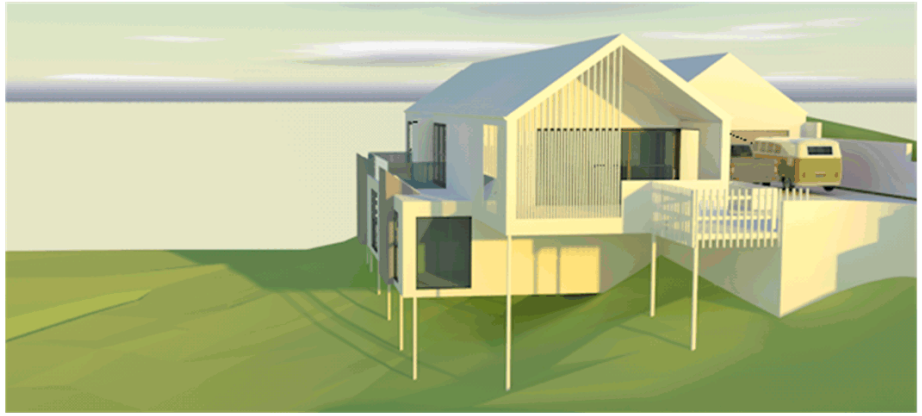
Date of Report: 4 January 2019

Attachment(s):

Attachment A - CPC Agenda Documents

Attachment B - Referral Officer Report - Environmental Development Planner

Attachment C - CPC Supporting Documents



DRAWING INDEX

Development Application Set

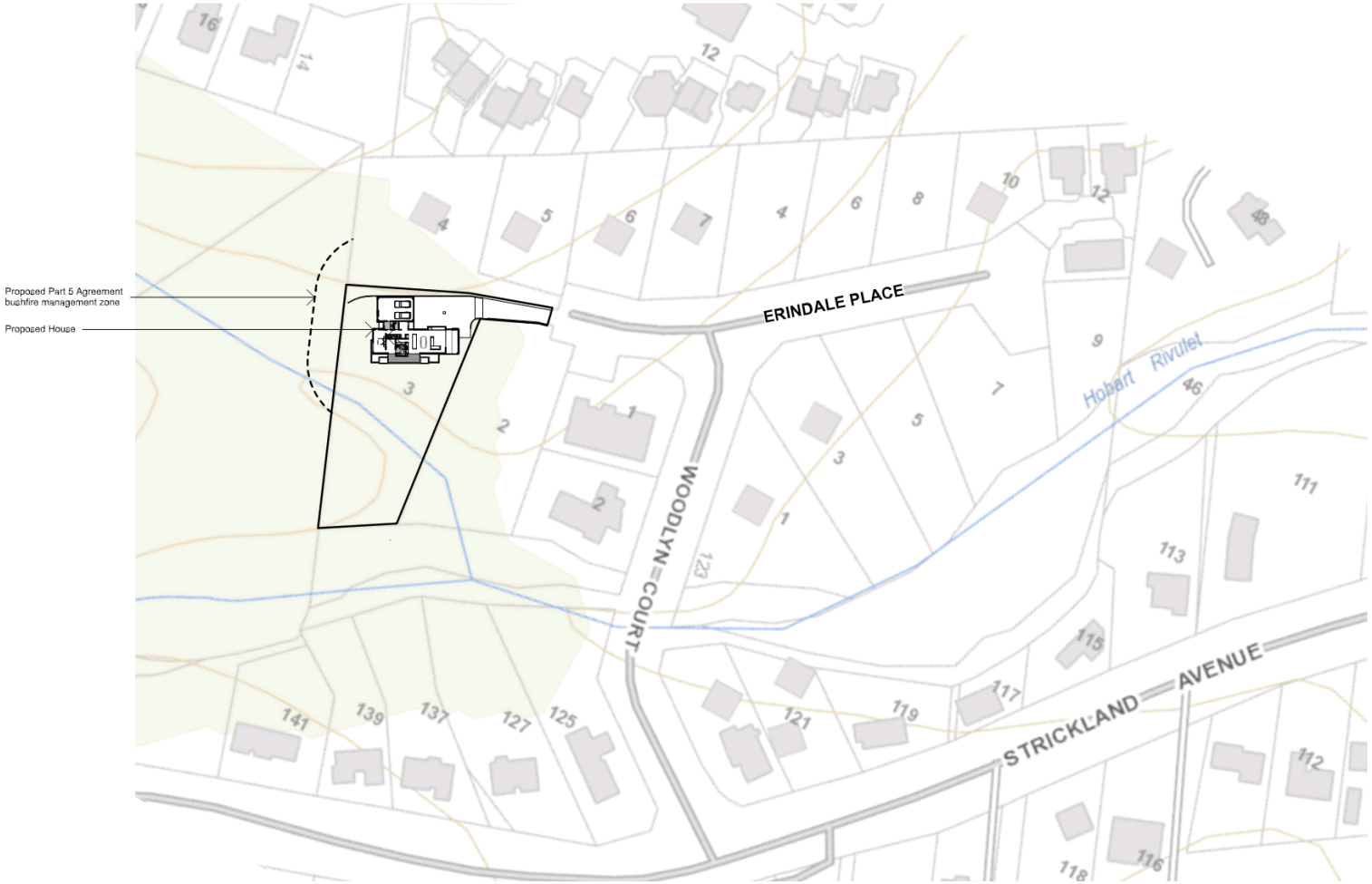
Drawing List					
Sheet No.	**Sheet Name**	**Sheet Size**	**Rev. No.**	**Rev. Date**	**Project No.**
101	Location Plan	A3			1706
102	Site Plan	A3			1706
103	Fire Setback Plan	A3			1706
104	Lower Floor Plan	A3			1706
105	Upper Floor Plan	A3			1706
106	Shadow Diagrams	A3			1706
107	Parking designs	A3			1706
201	South Elevations	A3			1706
202	East Elevation	A3			1706
203	North Elevation	A3			1706
301	Section 01	A3			1706
302	Sewer Line Section	A3			1706

RIVULET HOUSE

3 ERINDALE PLACE

SOUTH HOBART
TASMANIA

dlm
danny leigh macgregor design



This drawing is to be read in conjunction with all associated specifications, consultants drawings, geotechnical report and other written instructions

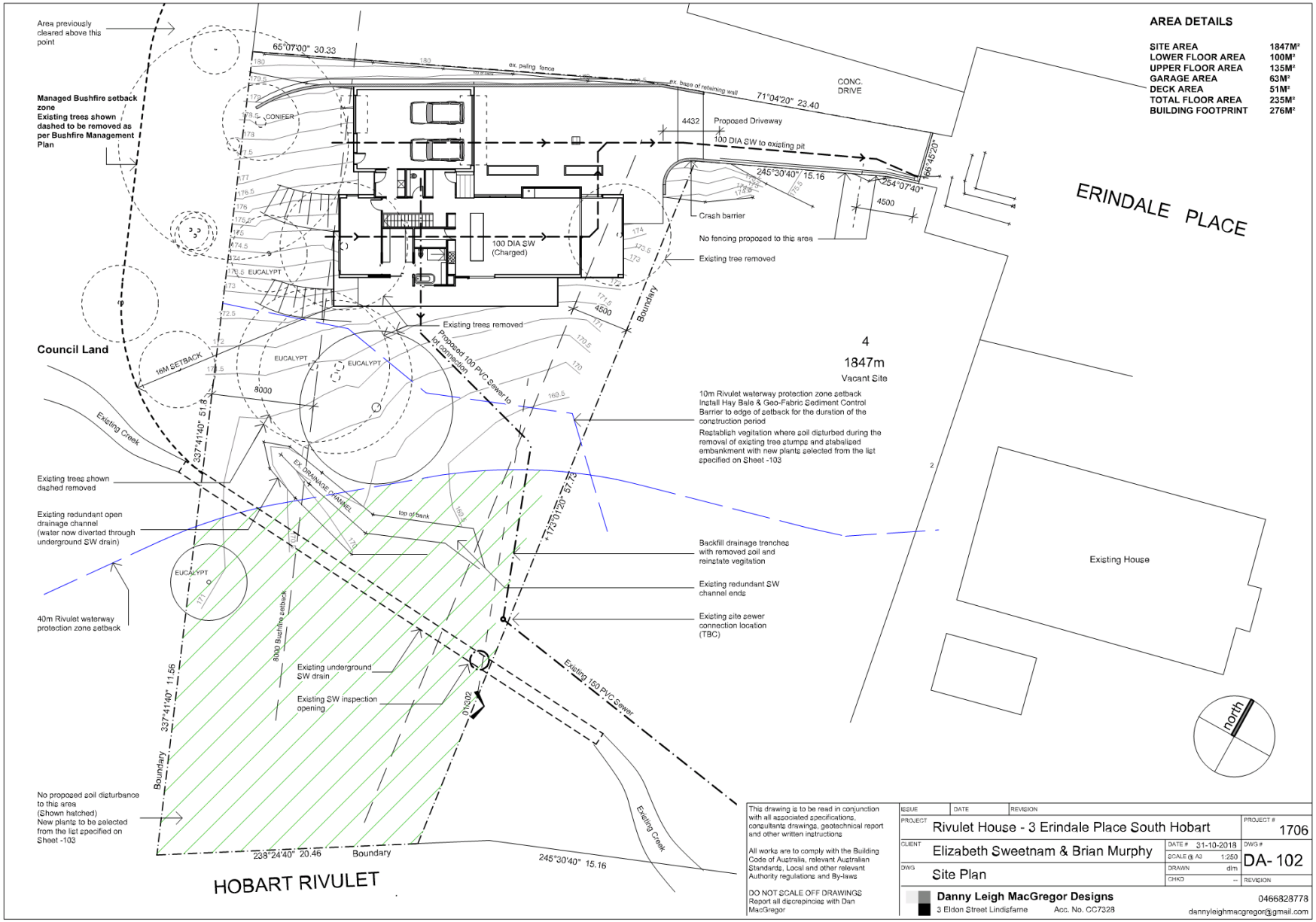
All works are to comply with the Building Code of Australia, relevant Australian Standards, Local and other relevant Authority regulations and By-laws

DO NOT SCALE OFF DRAWINGS
Report all discrepincies with Dan MacGregor

ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1706
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 31-10-2018 — DWG # DA- 101
SCALE @ A3 1:1000
DWG: Location Plan — DRAWN dlm
CHKD -- — REVISION

Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


AREA DETAILS
SITE AREA 1847M²
LOWER FLOOR AREA 100M²
UPPER FLOOR AREA 135M²
GARAGE AREA 63M²
DECK AREA 51M²
TOTAL FLOOR AREA 235M²
BUILDING FOOTPRINT 276M²
Area previously cleared above this point
Managed Bushfire setback zone
Existing trees shown dashed to be removed as per Bushfire Management Plan
65°07'00" 30.33
ex. paling fence
ex. base of retaining wall
71°04'20" 23.40
CONC. DRIVE
4432
Proposed Driveway
100 DIA SW to existing pit
245°30'40" 15.16
254°07'40"
166°45'20"
4500
ERINDALE PLACE
Crash barrier
No fencing proposed to this area
Existing tree removed
100 DIA SW (Charged)
Existing trees removed
Proposed 100 PVC Sewer to b/d connection
Boundary
4
1847m
Vacant Site
Council Land
16M SETBACK
8000
EUCALYPT
CONIFER
Existing Creek
337°41'40" 51.8
10m Rivulet waterway protection zone setback
Install Hay Bale & Geo-Fabric Sediment Control Barrier to edge of setback for the duration of the construction period
Reestablish vegitation where soil disturbed during the removal of existing tree stumps and stabalised embankment with new plants selected from the list specified on Sheet -103
Existing trees shown dashed removed
Existing redundant open drainage channel (water now diverted through underground SW drain)
EX. DRAINAGE CHANNEL
top of bank
175°01'20" 57.73
Backfill drainage trenches with removed soil and reinstate vegitation
Existing redundant SW channel ends
Existing site sewer connection location (TBC)
Existing House
40m Rivulet waterway protection zone setback
8000 Bushfire setback
Existing underground SW drain
Existing SW inspection opening
Existing 150 PVC Sewer
337°41'40" 11.56
Boundary
No proposed soil disturbance to this area (Shown hatched)
New plants to be selected from the list specified on Sheet -103
238°24'40" 20.46
Boundary
245°30'40" 15.16
Existing Creek
HOBART RIVULET
north
This drawing is to be read in conjunction with all associated specifications, consultants drawings, geotechnical report and other written instructions
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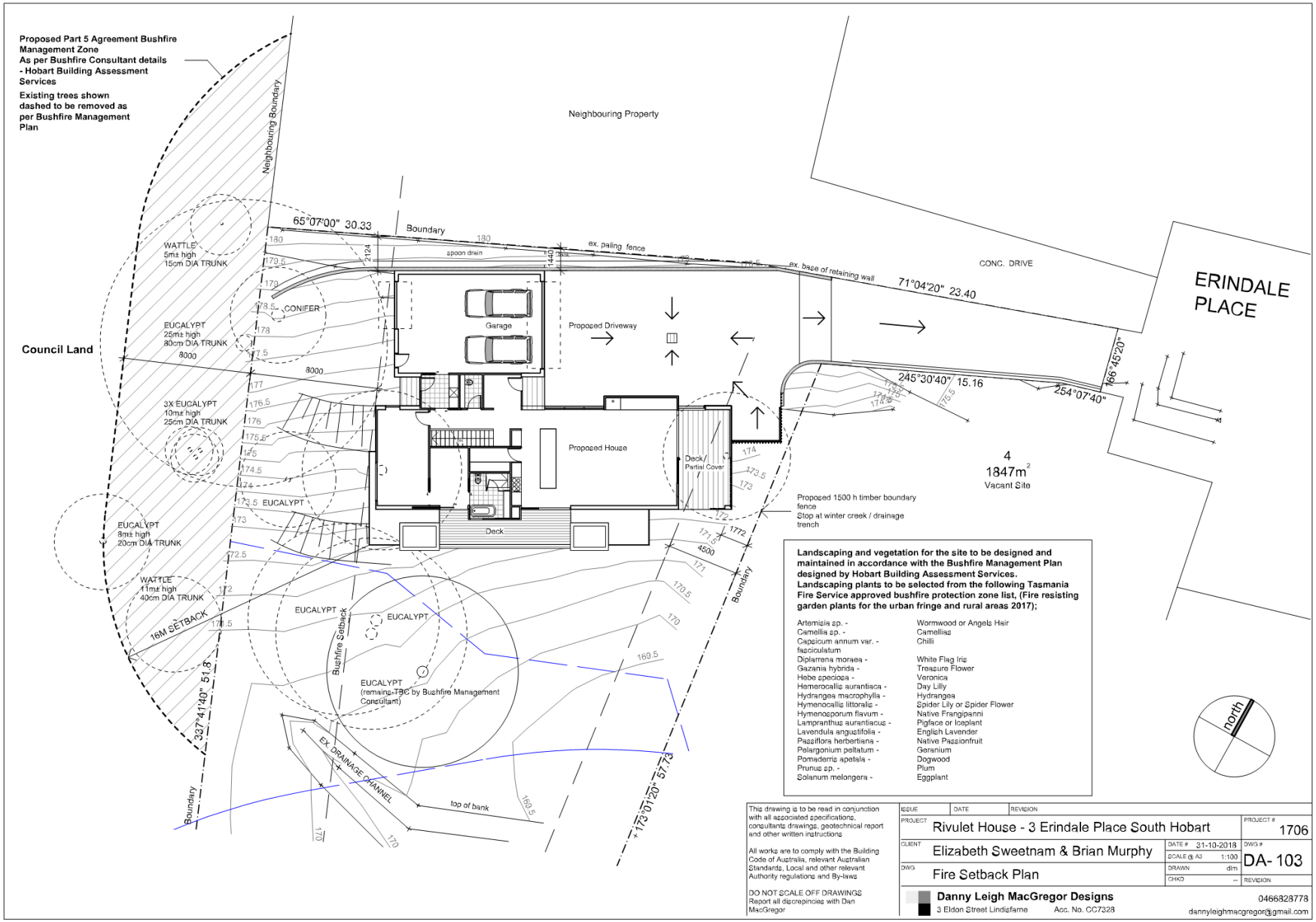
DO NOT SCALE OFF DRAWINGS
Report all discrepincies with Dan MacGregor
ISSUE
DATE
REVISION
PROJECT Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1706
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 31-10-2018
SCALE @ A3 1:250
DWG # DA- 102
DWG Site Plan
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


Proposed Part 5 Agreement Bushfire Management Zone
As per Bushfire Consultant details - Hobart Building Assessment Services
Existing trees shown dashed to be removed as per Bushfire Management Plan
Neighbouring Boundary
Neighbouring Property
Council Land
65°07'00" 30.33
Boundary
ex. paling fence
spoon drain
ex. base of retaining wall
CONC. DRIVE
ERINDALE PLACE
71°04'20" 23.40
166°45'20"
245°30'40" 15.16
254°07'40"
WATTLE 5m± high 15cm DIA TRUNK
CONIFER
EUCALYPT 25m± high 80cm DIA TRUNK
3X EUCALYPT 10m± high 25cm DIA TRUNK
EUCALYPT 8m± high 20cm DIA TRUNK
WATTLE 11m± high 40cm DIA TRUNK
Garage
Proposed Driveway
Proposed House
Deck
Deck / Partial Cover
16M SETBACK
Bushfire Setback
EUCALYPT
EUCALYPT (remains-TBC by Bushfire Management Consultant)
EX. DRAINAGE CHANNEL
top of bank
337°41'40" 51.8
173°01'20" 57.73
4
1847m²
Vacant Site
Proposed 1500 h timber boundary fence
Stop at winter creek / drainage trench
north
Landscaping and vegetation for the site to be designed and maintained in accordance with the Bushfire Management Plan designed by Hobart Building Assessment Services.
Landscaping plants to be selected from the following Tasmania Fire Service approved bushfire protection zone list, (Fire resisting garden plants for the urban fringe and rural areas 2017);
Artemisia sp. - Wormwood or Angels Hair
Camellia sp. - Camellias
Capsicum annum var. - fasciculatum Chilli
Diplarrena moraea - White Flag Iris
Gazania hybrida - Treasure Flower
Hebe speciosa - Veronica
Hemerocallis aurantiaca - Day Lilly
Hydrangea macrophylla - Hydrangea
Hymenocallis littoralis - Spider Lily or Spider Flower
Hymenosporum flavum - Native Frangipanni
Lampranthus aurantiacus - Pigface or Iceplant
Lavendula angustifolia - English Lavender
Passiflora herbertiana - Native Passionfruit
Pelargonium peltatum - Geranium
Pomaderris apetala - Dogwood
Prunus sp. - Plum
Solanum melongera - Eggplant
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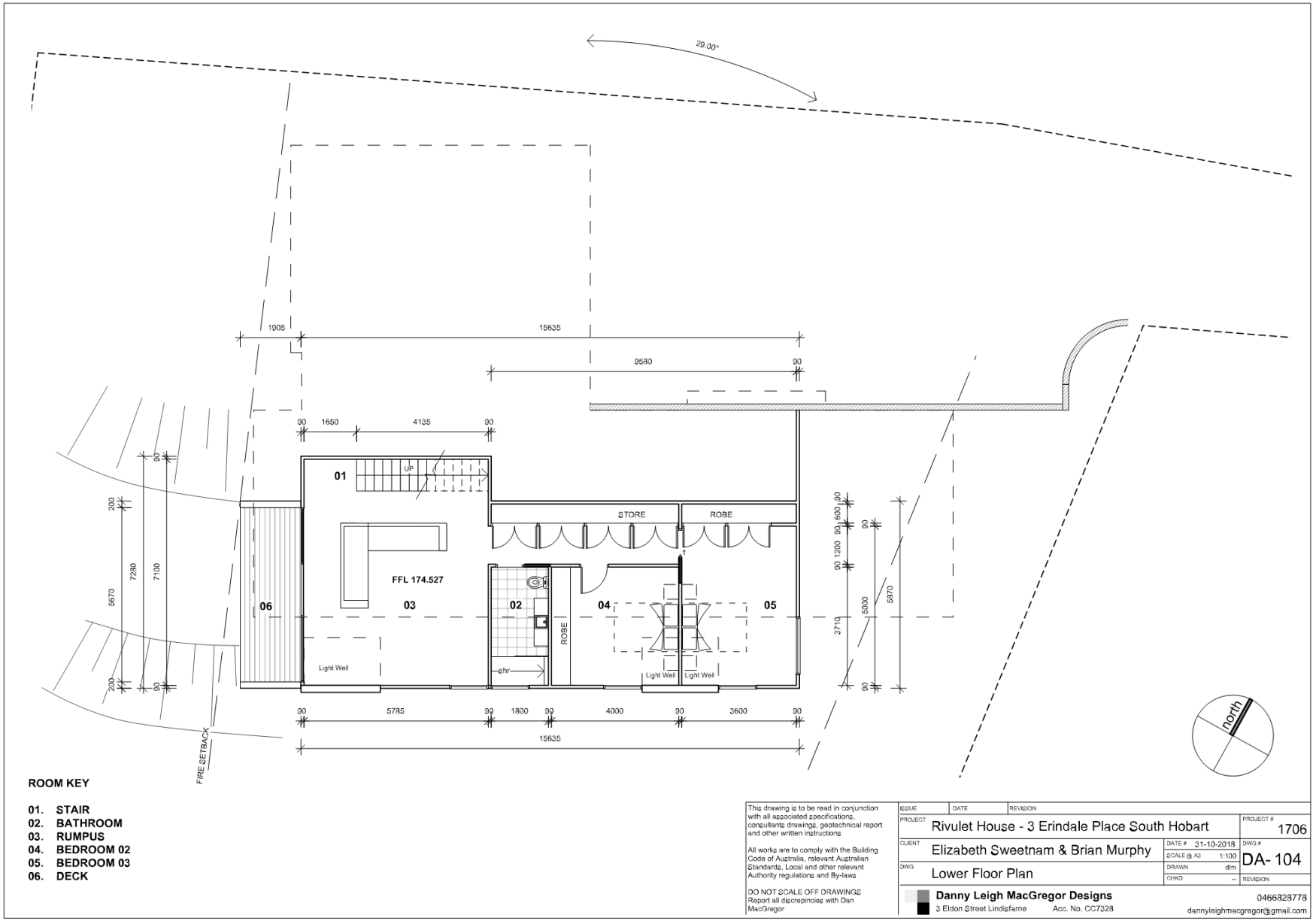
DO NOT SCALE OFF DRAWINGS
Report all discrepincies with Dan MacGregor
ISSUE
DATE
REVISION
PROJECT Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1706
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 31-10-2018
SCALE @ A3 1:100
DWG # DA- 103
DWG Fire Setback Plan
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


29.00°
1905
15635
9580
90
90 1650 4135 90
01
UP
STORE
ROBE
FFL 174.527
06
03
02
04
05
ROBE
Light Well
chr
Light Well
Light Well
90 5785 90 1800 90 4000 90 3600 90
15635
FIRE SETBACK
north
ROOM KEY
01. STAIR
02. BATHROOM
03. RUMPUS
04. BEDROOM 02
05. BEDROOM 03
06. DECK
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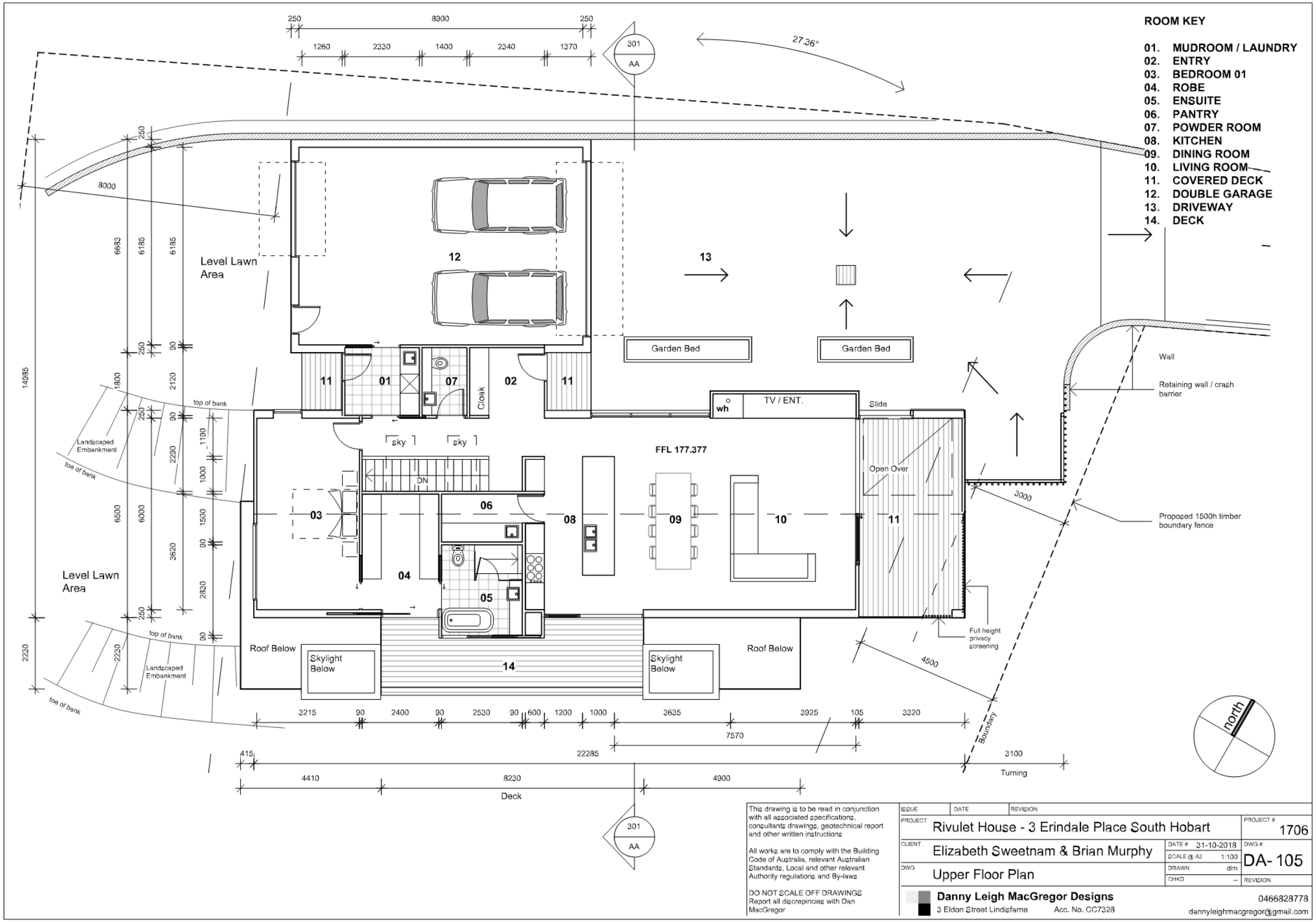
ISSUE
DATE
REVISION
PROJECT Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1706
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 31-10-2018
SCALE @ A3 1:100
DWG # DA- 104
DWG Lower Floor Plan
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


ROOM KEY
01. MUDROOM / LAUNDRY
02. ENTRY
03. BEDROOM 01
04. ROBE
05. ENSUITE
06. PANTRY
07. POWDER ROOM
08. KITCHEN
09. DINING ROOM
10. LIVING ROOM
11. COVERED DECK
12. DOUBLE GARAGE
13. DRIVEWAY
14. DECK
Level Lawn Area
Landscaped Embankment
top of bank
toe of bank
Garden Bed
TV / ENT.
wh
Slide
Open Over
FFL 177.377
sky
DN
Cloak
Roof Below
Skylight Below
Wall
Retaining wall / crash barrier
Proposed 1500h timber boundary fence
Full height privacy screening
Boundary
Turning
Deck
north
27.36°
301
AA
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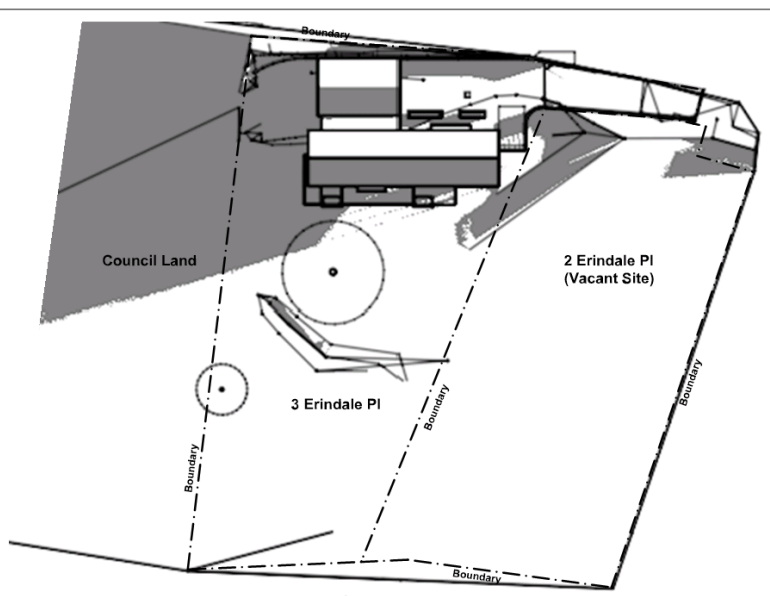
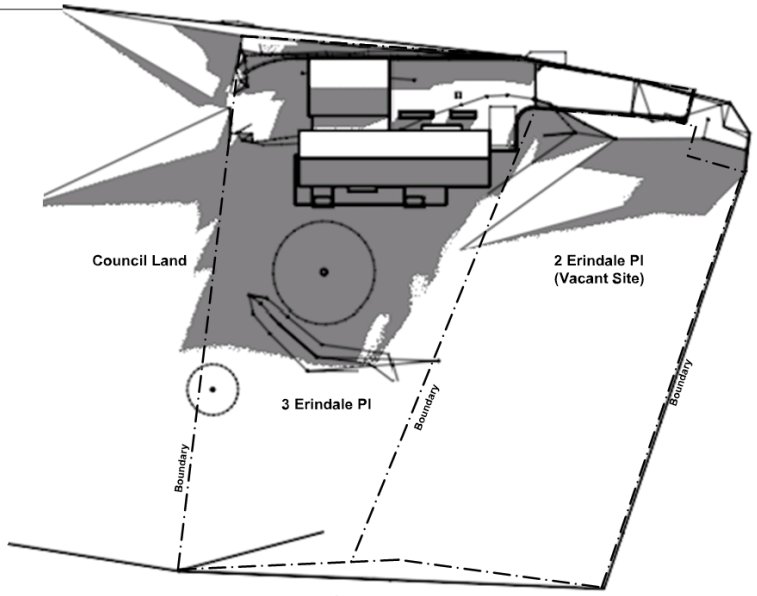
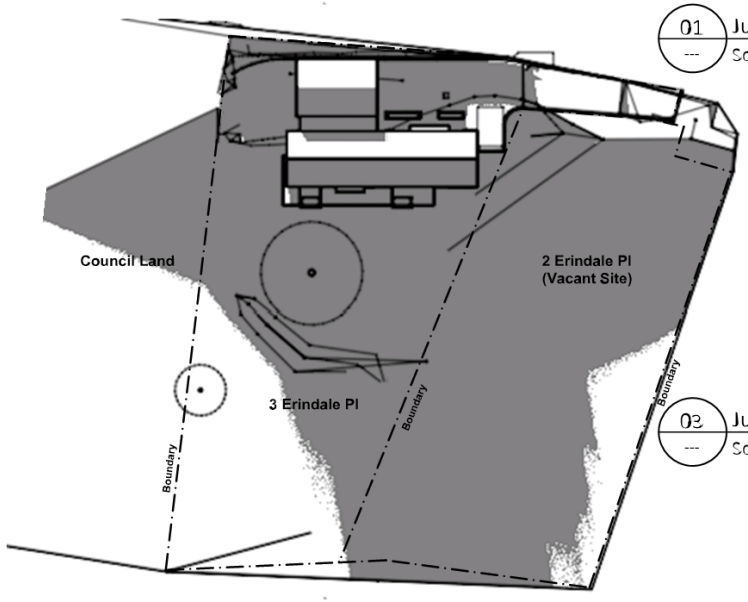
ISSUE
DATE
REVISION
PROJECT
Rivulet House - 3 Erindale Place South Hobart
PROJECT #
1706
CLIENT
Elizabeth Sweetnam & Brian Murphy
DATE # 31-10-2018
SCALE @ A3 1:100
DRAWN dlm
CHKD --
DWG #
DA- 105
REVISION
DWG
Upper Floor Plan
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com



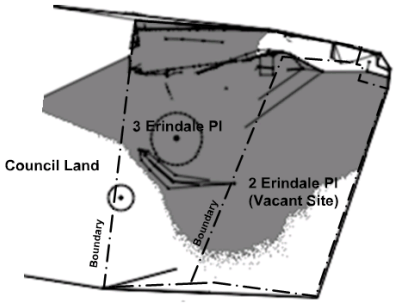
01 --- June 21- 9am. Proposed
Scale 1:500



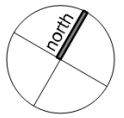
02 --- June 21- 12pm. Proposed
Scale 1:500



03 --- June 21- 3pm. Proposed
Scale 1:500



03 --- June 21- 3pm. Existing
Scale 1:1000



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ISSUE	DATE	REVISION
PROJECT	Rivulet House - 3 Erindale Place South Hobart	PROJECT # 1706
CLIENT	Elizabeth Sweetnam & Brian Murphy	DATE # 31-10-2018
		SCALE @ A3 1:100
DWG	Shadow Diagrams	DWG # DA- 106
		DRAWN dlm
		CHKD --
		REVISION

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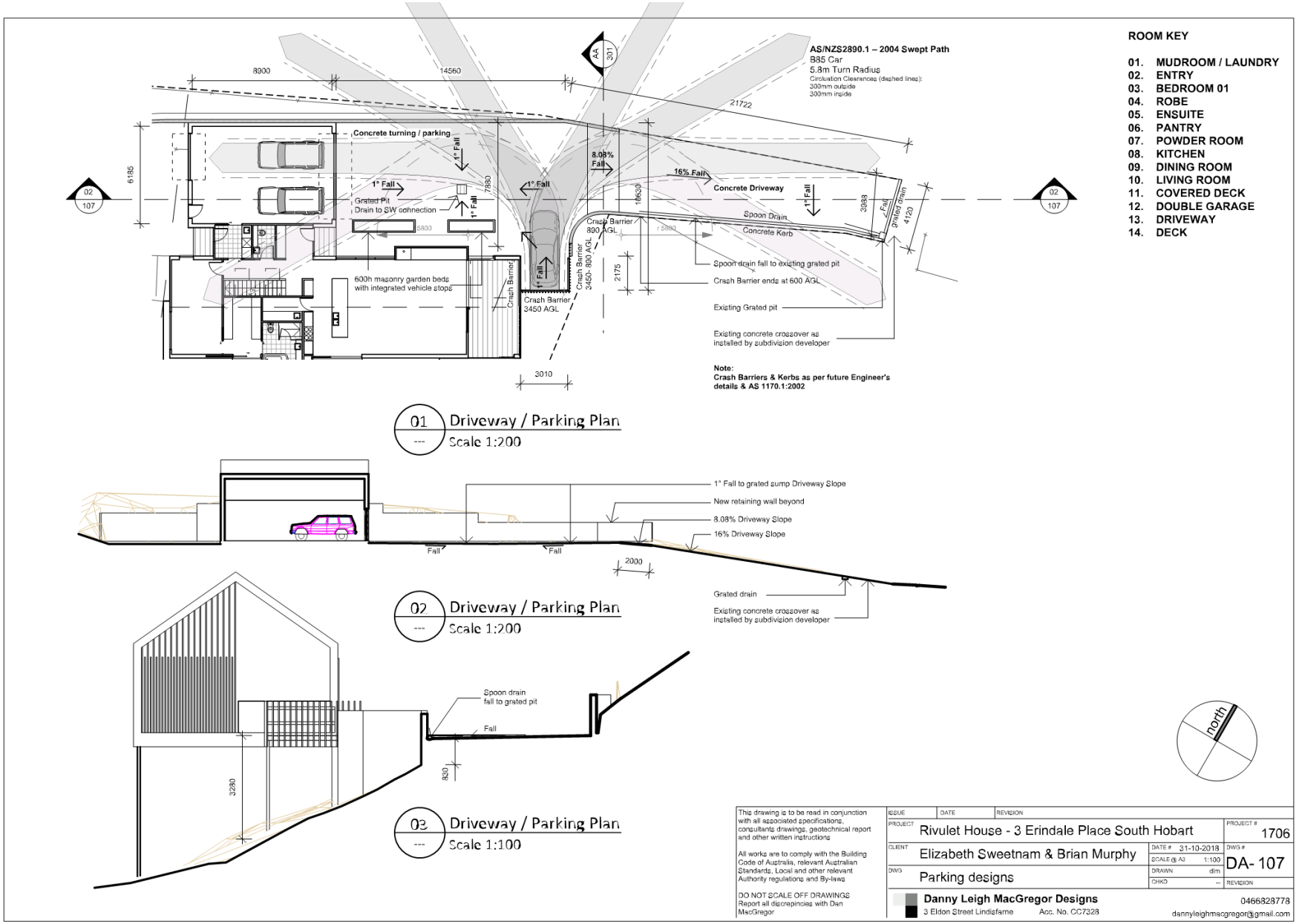
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


AS/NZS2890.1 – 2004 Swept Path
B85 Car
5.8m Turn Radius
Circulation Clearances (dashed lines):
300mm outside
300mm inside
ROOM KEY
01. MUDROOM / LAUNDRY
02. ENTRY
03. BEDROOM 01
04. ROBE
05. ENSUITE
06. PANTRY
07. POWDER ROOM
08. KITCHEN
09. DINING ROOM
10. LIVING ROOM
11. COVERED DECK
12. DOUBLE GARAGE
13. DRIVEWAY
14. DECK
Concrete turning / parking
Grated Pit
Drain to SW connection
600h masonry garden beds with integrated vehicle stops
Crash Barrier 3450 AGL
Crash Barrier 800 AGL
Concrete Driveway
Spoon Drain
Concrete Kerb
Spoon drain fall to existing grated pit
Crash Barrier ends at 600 AGL
Existing Grated pit
Existing concrete crossover as installed by subdivision developer
Note:
Crash Barriers & Kerbs as per future Engineer's details & AS 1170.1:2002
01 Driveway / Parking Plan
Scale 1:200
1° Fall to grated sump Driveway Slope
New retaining wall beyond
8.08% Driveway Slope
16% Driveway Slope
Grated drain
Existing concrete crossover as installed by subdivision developer
02 Driveway / Parking Plan
Scale 1:200
Spoon drain fall to grated pit
03 Driveway / Parking Plan
Scale 1:100
north
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ISSUE
DATE
REVISION
PROJECT Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1706
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 31-10-2018
SCALE @ A3 1:100
DWG # DA- 107
DWG Parking designs
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com

KEY

FC1 - FC SHEET CLADDING (SCYON AXON OR SIMILAR) PAINT FINISH TO MATCH EXISTING
FC2- FC SHEET CLADDING (SCYON MATRIX) EXPRESSED JOINT
SC1 - BATTEN SCREEN MODWOOD OR SIMILAR
SC2 - BATTEN SCREEN MODWOOD OR SIMILAR (max 25% uniform transparency)
GL - GLAZING
MA - BLOCKWORK MASONRY
GB - GLASS BALUSTRADE
CC - COLORBOND CLADDING (COLOUR AS SELECTED)
P - PAINTED STEEL POSTS
PD - PANEL LIFT DOOR

01 South Elevation
--- Scale 1:100

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ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1706
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 31-10-2018 — DWG # DA- 201
DWG: South Elevations — SCALE @ A3 1:100 — DRAWN dlm — CHKD -- — REVISION

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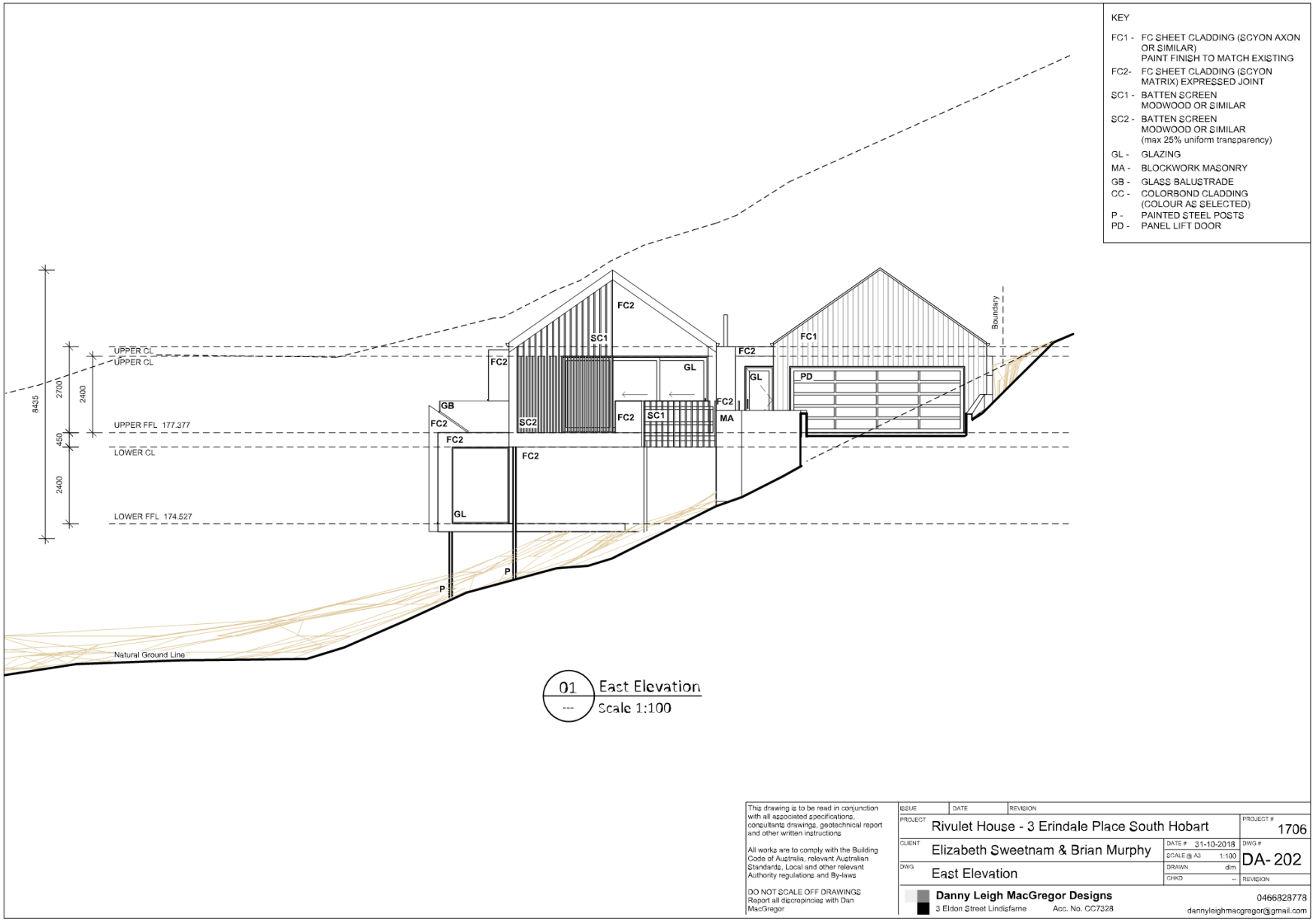
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


KEY
FC1 - FC SHEET CLADDING (SCYON AXON OR SIMILAR) PAINT FINISH TO MATCH EXISTING
FC2- FC SHEET CLADDING (SCYON MATRIX) EXPRESSED JOINT
SC1 - BATTEN SCREEN MODWOOD OR SIMILAR
SC2 - BATTEN SCREEN MODWOOD OR SIMILAR (max 25% uniform transparency)
GL - GLAZING
MA - BLOCKWORK MASONRY
GB - GLASS BALUSTRADE
CC - COLORBOND CLADDING (COLOUR AS SELECTED)
P - PAINTED STEEL POSTS
PD - PANEL LIFT DOOR
8435
2700
2400
450
2400
UPPER CL
UPPER CL
UPPER FFL 177.377
LOWER CL
LOWER FFL 174.527
Natural Ground Line
Boundary
FC2
SC1
FC1
GL
PD
GB
SC2
MA
P
01
East Elevation
Scale 1:100
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ISSUE
DATE
REVISION
PROJECT
Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1706
CLIENT
Elizabeth Sweetnam & Brian Murphy
DATE # 31-10-2018
SCALE @ A3 1:100
DWG #
DA- 202
DWG
East Elevation
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
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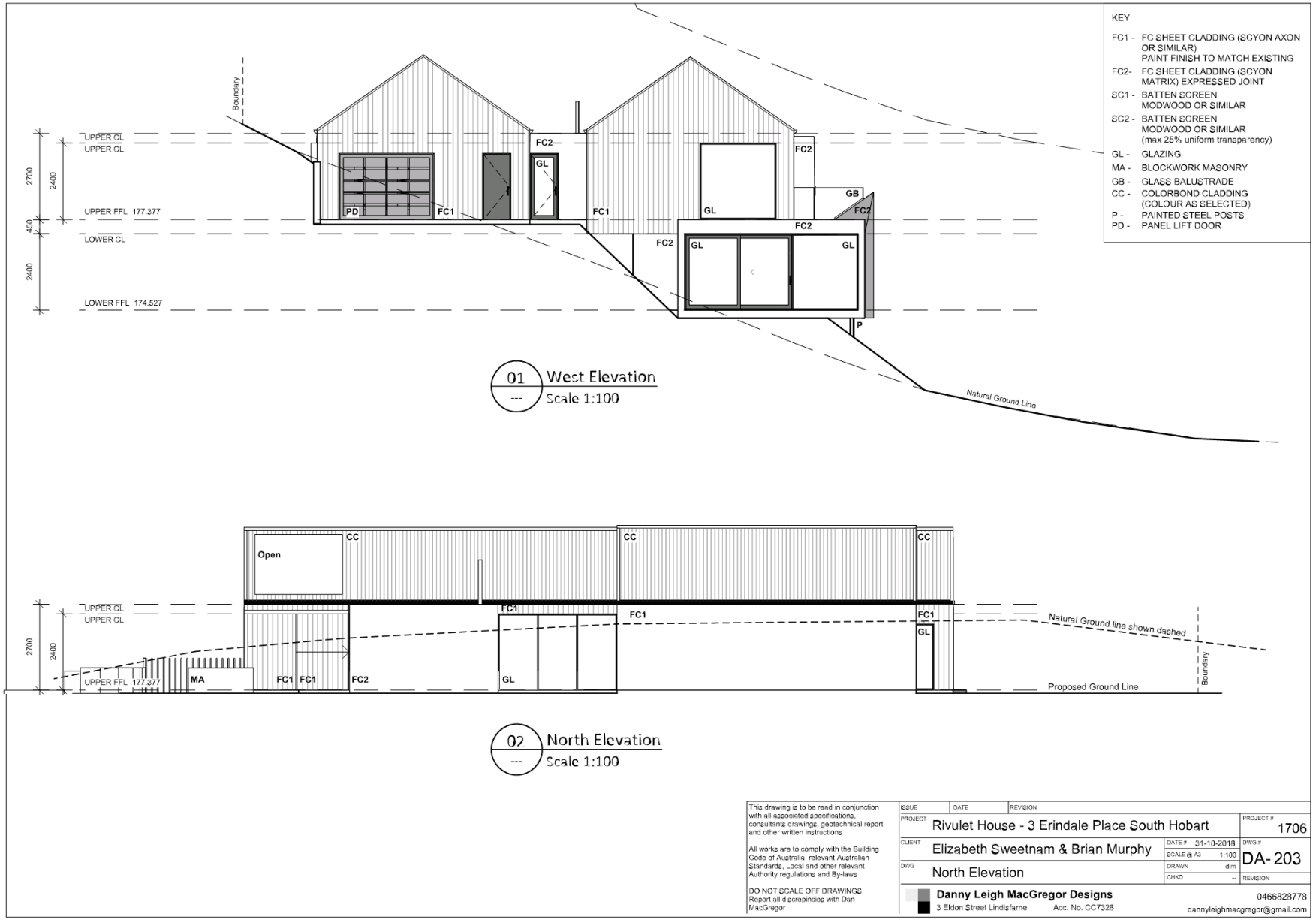
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com



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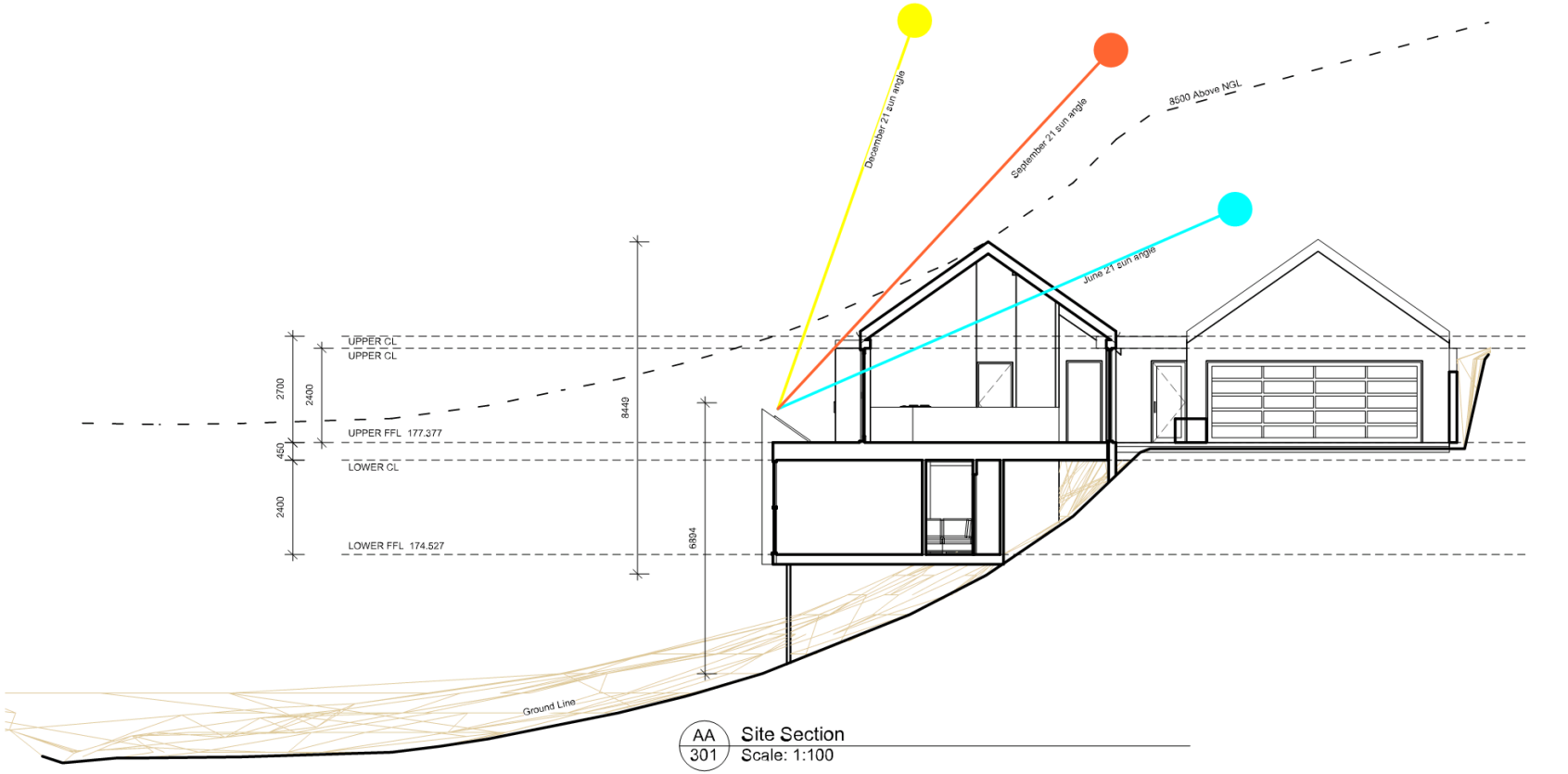
DO NOT SCALE OFF DRAWINGS
Report all discrepincies with Dan MacGregor

ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1706
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 31-10-2018 — SCALE @ A3 1:100 — DWG # DA- 203
DWG: North Elevation — DRAWN dlm — CHKD -- — REVISION

Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com



AA 301 Site Section
Scale: 1:100

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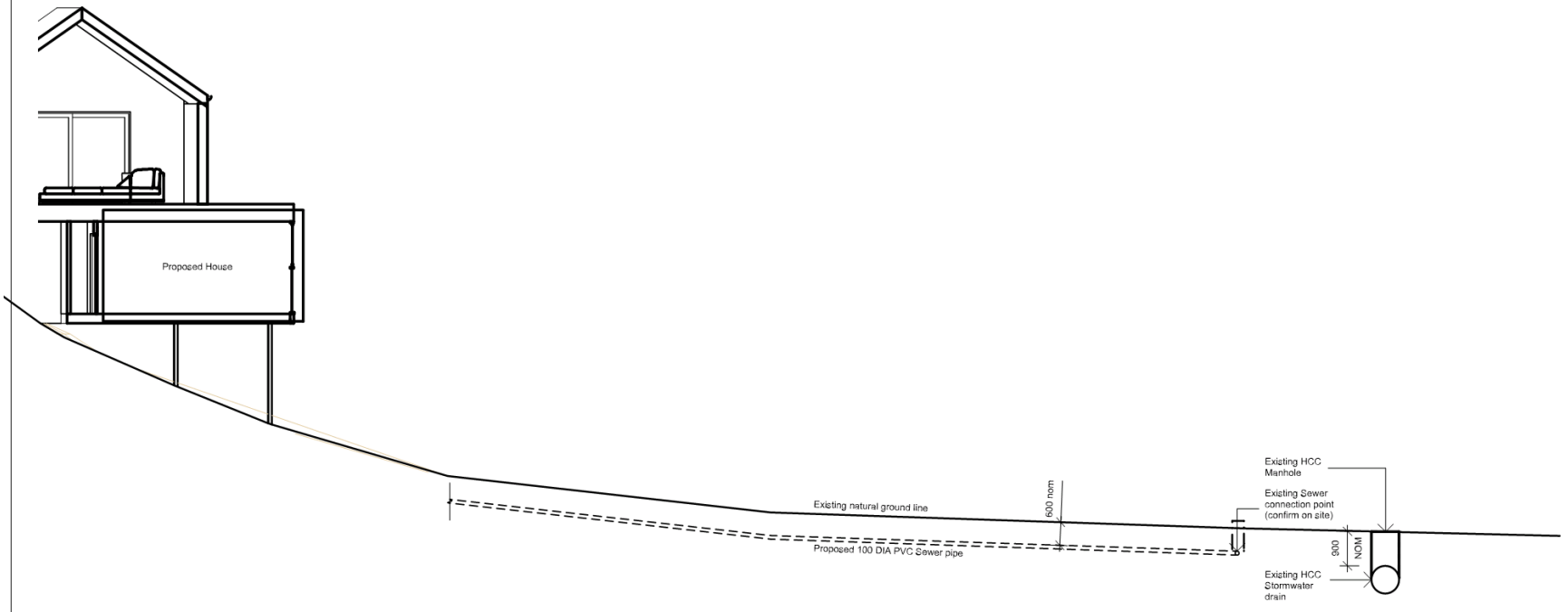
DO NOT SCALE OFF DRAWINGS
Report all discrepincies with Dan MacGregor

ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1706
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 31-10-2018 — DWG # DA-301
DWG: Section 01 — SCALE @ A3 1:100 — DRAWN dlm — CHKD -- — REVISION

Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com



3/302 Plumbing Section
Scale: 1:100

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ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1706
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 31-10-2018 — DWG # DA-302
SCALE @ A3 1:100
DWG: Sewer Line Section
DRAWN dlm
CHKD --
REVISION

Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com

City of HOBART

Enquiries to: John Fisher
☎: (03) 6238 2886
✉: coh@hobartcity.com.au
Our Ref: 3099843; 5593263

6 September 2018

Dan McGregor
Building Designer

Via Email: dannyleighmacgregor@gmail.com

Dear Mr McGregor

NOTICE OF LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**3 Erindale Place, South Hobart and 163 Strickland Ave, South Hobart (Council land)**
Description of Proposal:	**Firebreak / Hazard Management Area on Council land for development of single dwelling on private land**
Applicant Name:	**Dan McGregor, Building Designer**
PLN	**Request prior to lodgement of planning application**

I write to advise that pursuant to Section 52 of the *Land Use Planning and Approvals Act 1993*, I grant my consent on behalf of the Hobart City Council as the owner/administrator of the above land for you to make application to the City for a planning permit for the development described above and as per the attached documents.

Please note that the granting of the consent is only for the making of the application and in no way should such consent be seen as prejudicing any decision the Council is required to make as the statutory planning authority or as the owner/administrator of the land.

Yours faithfully

(N D Heath)
GENERAL MANAGER

Attachment: Land Owner Consent

City of HOBART

3099843
5593263

LAND OWNER CONSENT TO LODGE A PLANNING APPLICATION

Site Address:	**3 Erindale Place, South Hobart and 163 Strickland Ave, South Hobart (Council land)**
Description of Proposal:	**Firebreak / Hazard Management Area on Council land for development of single dwelling on private land**
Applicant Name:	**Dan McGregor, Building Designer** **dannyleighmacgregor@gmail.com** **m 0466828778**
PLN	**Request prior to lodgement of planning application**

The land indicated above is owned or is administered by the Hobart City Council.

The applicant proposes to lodge an application for a permit, pursuant to the *Land Use Planning and Approvals Act 1993,* in respect to the proposal described above.

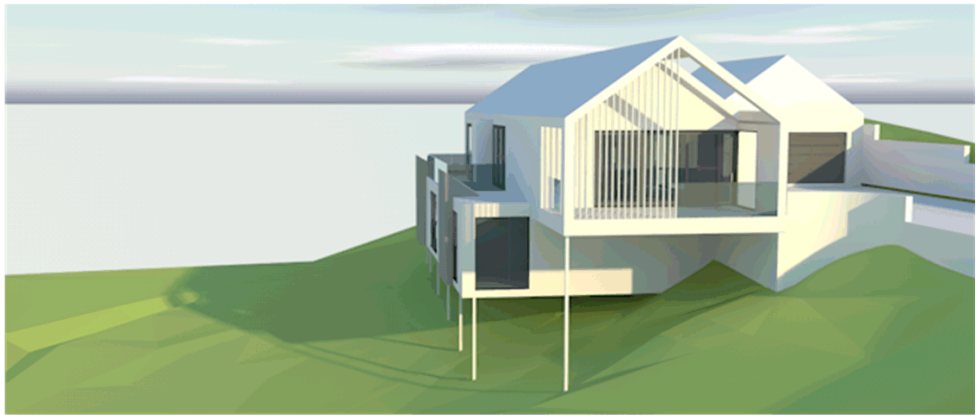
Part or all of the application proposes use and/or development on land owned or administered by the City located at (as shown on the attached plans).
Being and as General Manager of the Hobart City Council, I provide written permission to the making of the application pursuant to Section 52(1B)(b) of the *Land Use Planning and Approvals Act 1993.*

(N D Heath)
GENERAL MANAGER

Date: 7/9/18

This consent is for the making of a planning application only, and does not constitute landlord consent for the development to occur.

Attachments/Plans:



DRAWING INDEX

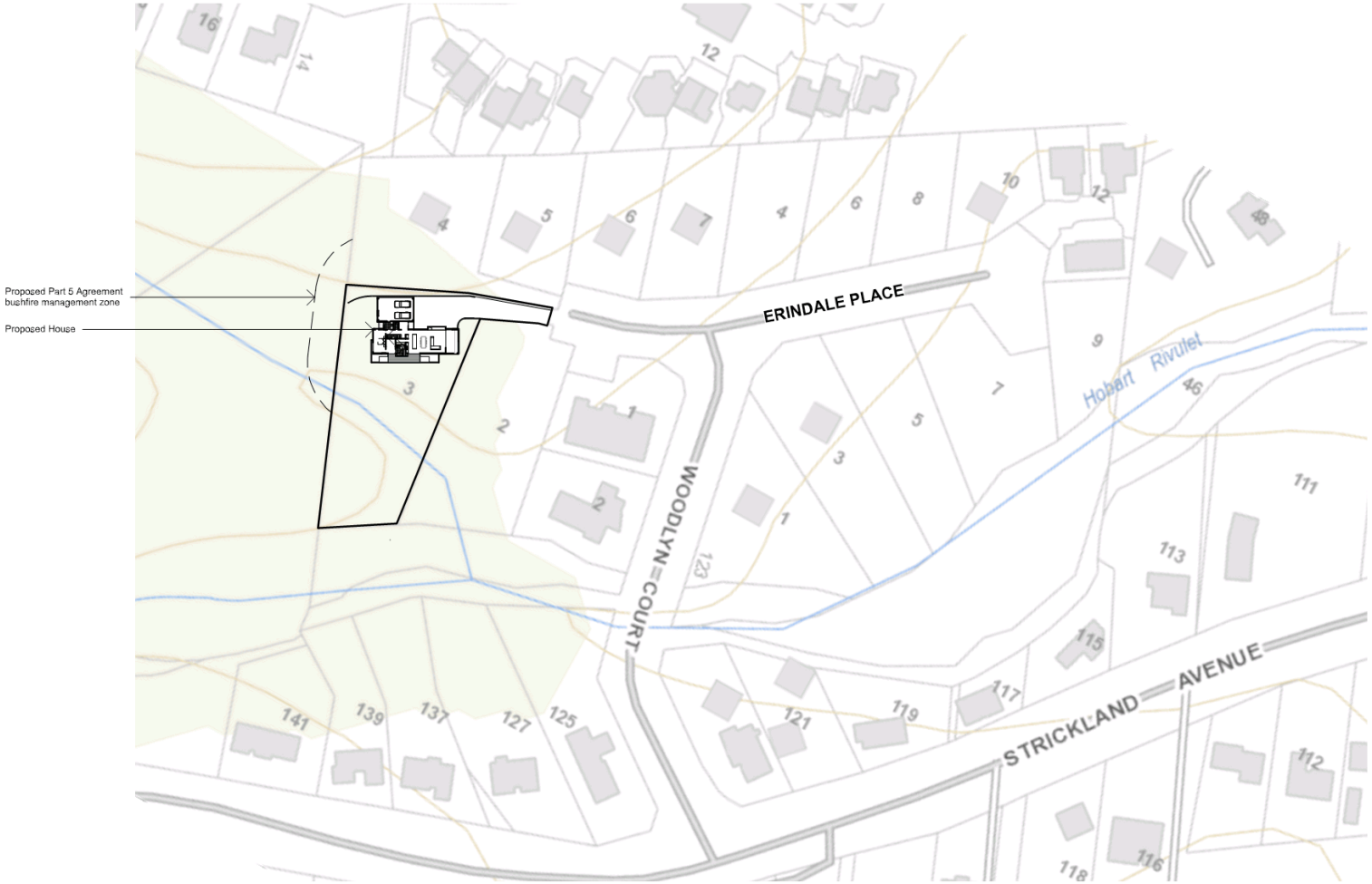
Development Application Set

dwg. no.	dwg. title
DA - 101	LOCATION PLAN
DA - 102	SITE PLAN
DA - 103	SITE SETOUT FIRE SETBACK
DA - 101	LOWER FLOOR PLAN
DA - 102	UPPER FLOOR PLAN
DA - 201	ELEVATIONS 01
DA - 202	ELEVATIONS 02
DA - 203	ELEVATIONS 03
DA - 301	SITE SECTION

RIVULET HOUSE

3 ERINDALE PLACE
SOUTH HOBART
TASMANIA

dlm
danny leigh macgregor design



This drawing is to be read in conjunction with all associated specifications, consultants drawings, geotechnical report and other written instructions

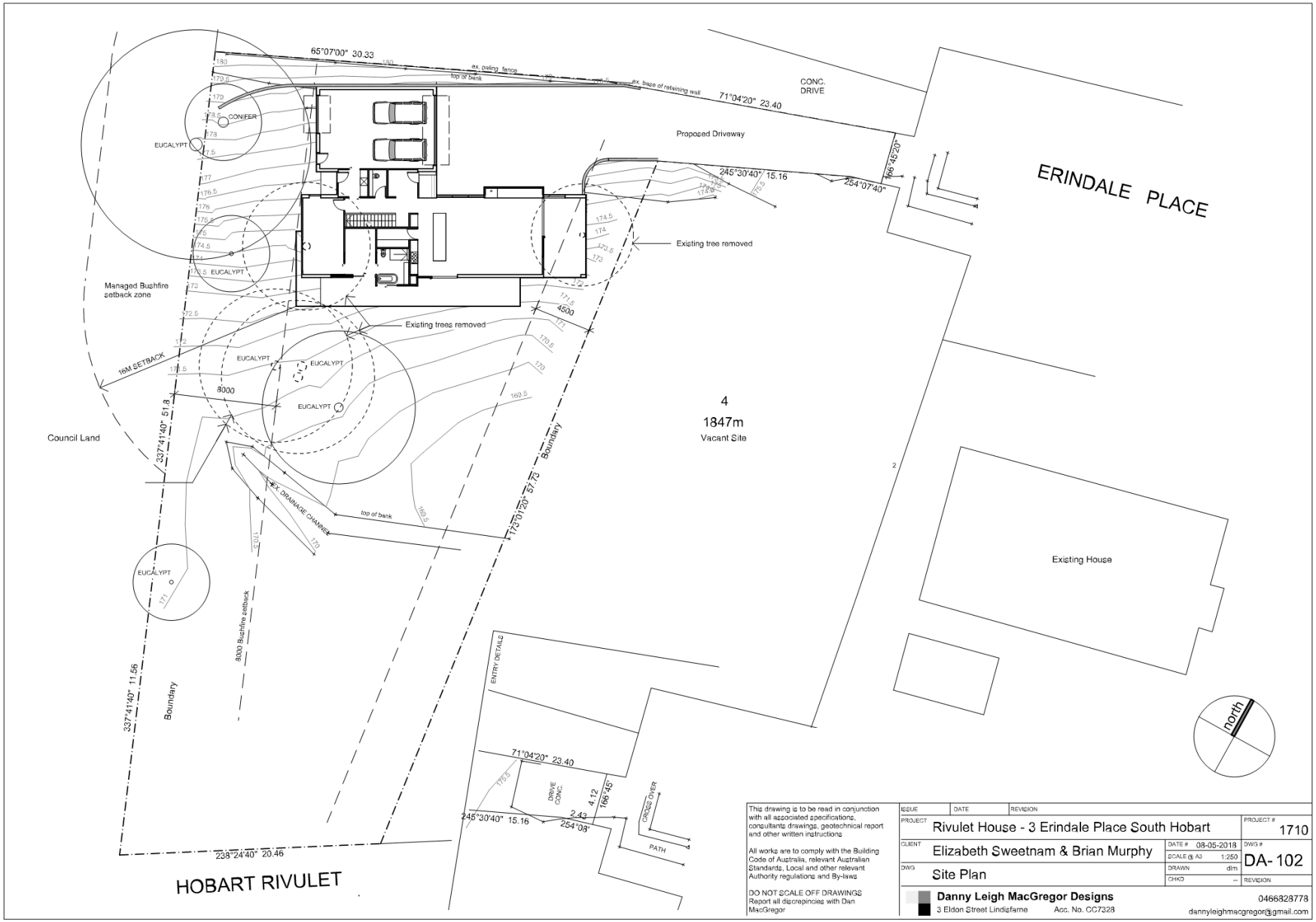
All works are to comply with the Building Code of Australia, relevant Australian Standards, Local and other relevant Authority regulations and By-laws

DO NOT SCALE OFF DRAWINGS
Report all discrepincies with Dan MacGregor

ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1710
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 08-05-2018 — DWG # DA- 101
SCALE @ A3 1:1000
DWG: Location Plan — DRAWN dlm
CHKD -- — REVISION

Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com



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ISSUE	DATE	REVISION

PROJECT	Rivulet House - 3 Erindale Place South Hobart		PROJECT # 1710
CLIENT	Elizabeth Sweetnam & Brian Murphy	DATE # 08-05-2018	DWG # DA- 102
		SCALE @ A3 1:250	
DWG	Site Plan	DRAWN dlm	
		CHKD --	REVISION

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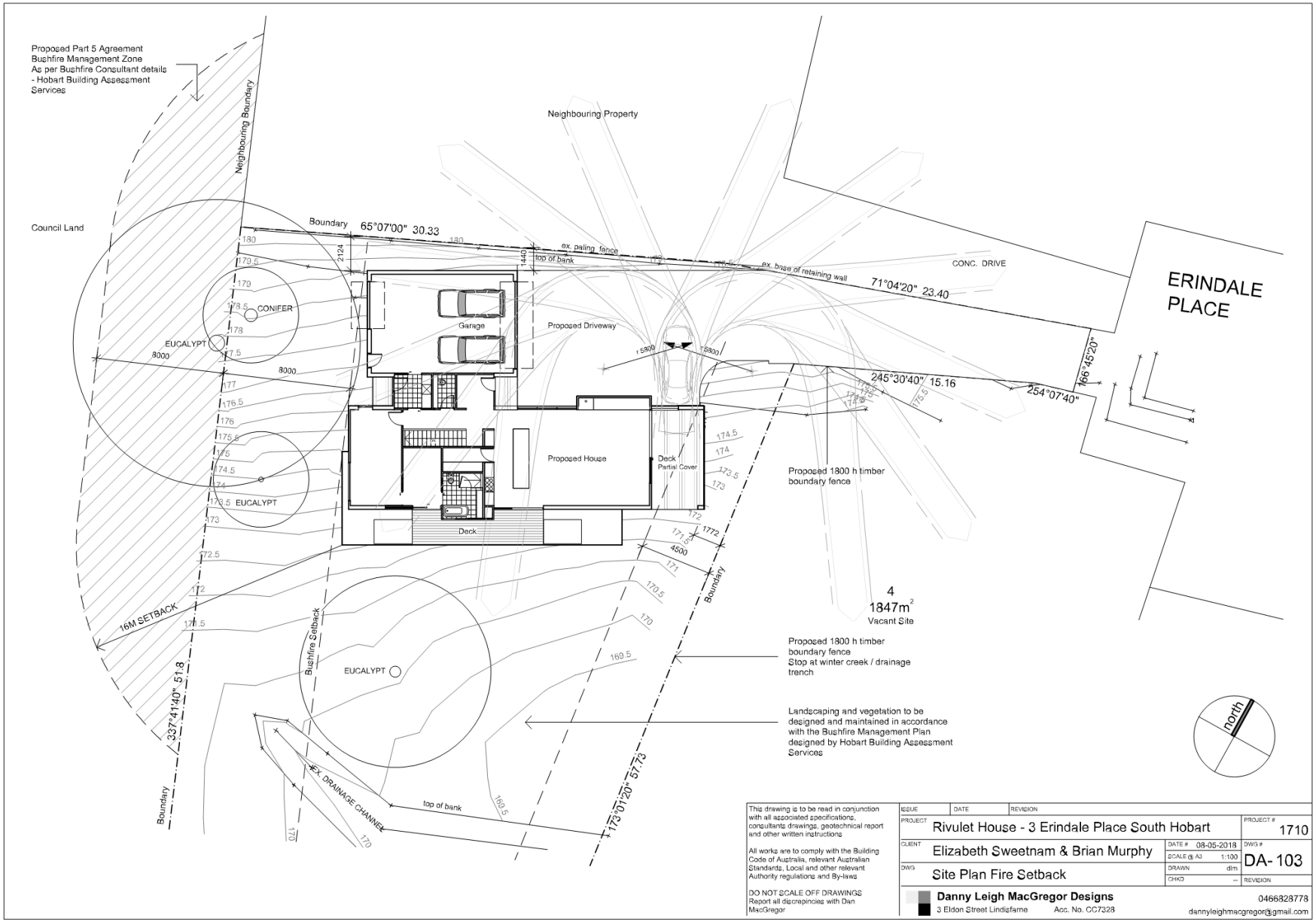
dannyleighmacgregor@gmail.com


Proposed Part 5 Agreement
Bushfire Management Zone
As per Bushfire Consultant details
- Hobart Building Assessment
Services
Neighbouring Boundary
Neighbouring Property
Council Land
Boundary 65°07'00" 30.33
ex. paling fence
top of bank
ex. base of retaining wall
71°04'20" 23.40
CONC. DRIVE
ERINDALE
PLACE
CONIFER
EUCALYPT
Garage
Proposed Driveway
245°30'40" 15.16
254°07'40"
166°45'20"
Proposed House
Deck
Partial Cover
Proposed 1800 h timber
boundary fence
Deck
16M SETBACK
Bushfire Setback
4
1847m²
Vacant Site
Proposed 1800 h timber
boundary fence
Stop at winter creek / drainage
trench
Landscaping and vegetation to be
designed and maintained in accordance
with the Bushfire Management Plan
designed by Hobart Building Assessment
Services
337°41'40" 51.8
173°01'20" 57.73
EX. DRAINAGE CHANNEL
top of bank
north
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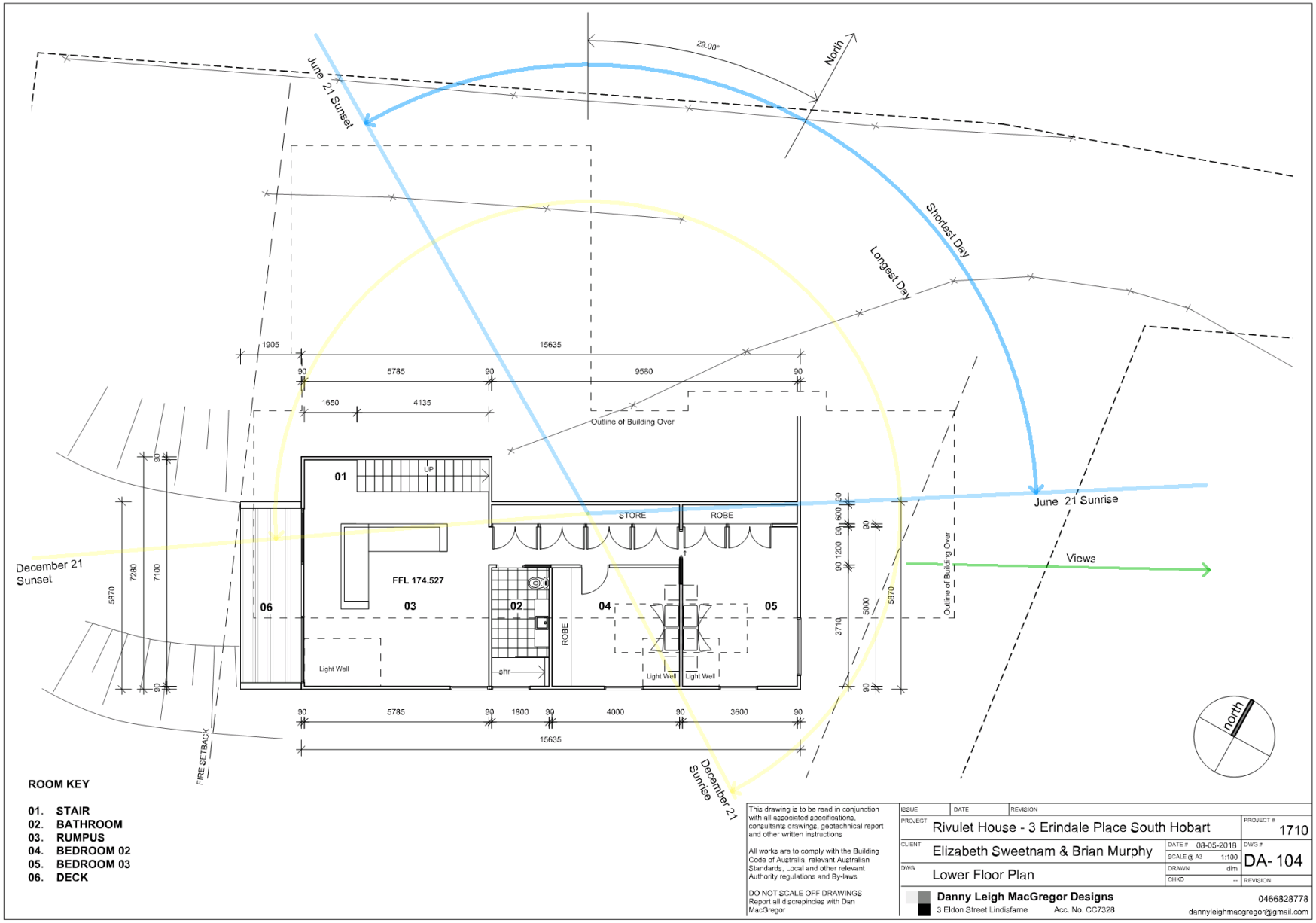
ISSUE
DATE
REVISION
PROJECT
Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1710
CLIENT
Elizabeth Sweetnam & Brian Murphy
DATE # 08-05-2018
SCALE @ A3 1:100
DWG # DA- 103
DWG
Site Plan Fire Setback
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


29.00°
North
June 21 Sunset
Shortest Day
Longest Day
June 21 Sunrise
Views
December 21 Sunset
December 21 Sunrise
Outline of Building Over
FIRE SETBACK
01
UP
STORE
ROBE
FFL 174.527
06
03
02
04
05
ROBE
Light Well
chr
1905
15635
5785
9580
1650
4135
1800
4000
3600
7280
7100
5870
600
1200
5000
3710
north
ROOM KEY
01. STAIR
02. BATHROOM
03. RUMPUS
04. BEDROOM 02
05. BEDROOM 03
06. DECK
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PROJECT
Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1710
CLIENT
Elizabeth Sweetnam & Brian Murphy
DATE # 08-05-2018
SCALE @ A3 1:100
DWG #
DA- 104
DWG
Lower Floor Plan
DRAWN dlm
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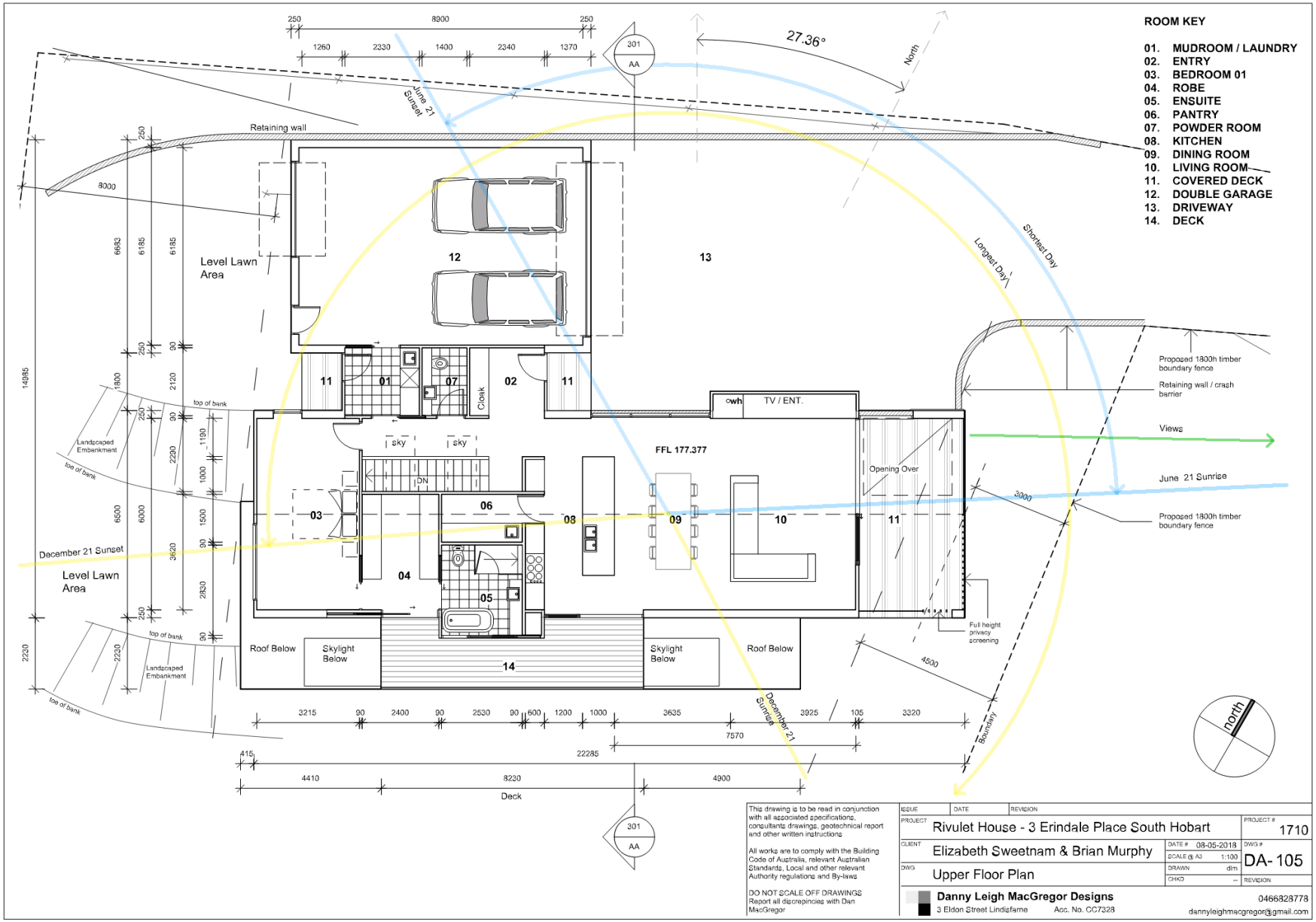
3 Eldon Street Lindisfarne
Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com


ROOM KEY
01. MUDROOM / LAUNDRY
02. ENTRY
03. BEDROOM 01
04. ROBE
05. ENSUITE
06. PANTRY
07. POWDER ROOM
08. KITCHEN
09. DINING ROOM
10. LIVING ROOM
11. COVERED DECK
12. DOUBLE GARAGE
13. DRIVEWAY
14. DECK
27.36°
North
June 21 Sunset
Retaining wall
Level Lawn Area
Shortest Day
Longest Day
Proposed 1800h timber boundary fence
Retaining wall / crash barrier
Views
June 21 Sunrise
Proposed 1800h timber boundary fence
TV / ENT.
FFL 177.377
Opening Over
Full height privacy screening
December 21 Sunset
Level Lawn Area
Landscaped Embankment
top of bank
toe of bank
Roof Below
Skylight Below
Skylight Below
Roof Below
December 21 Sunrise
Boundary
Deck
north
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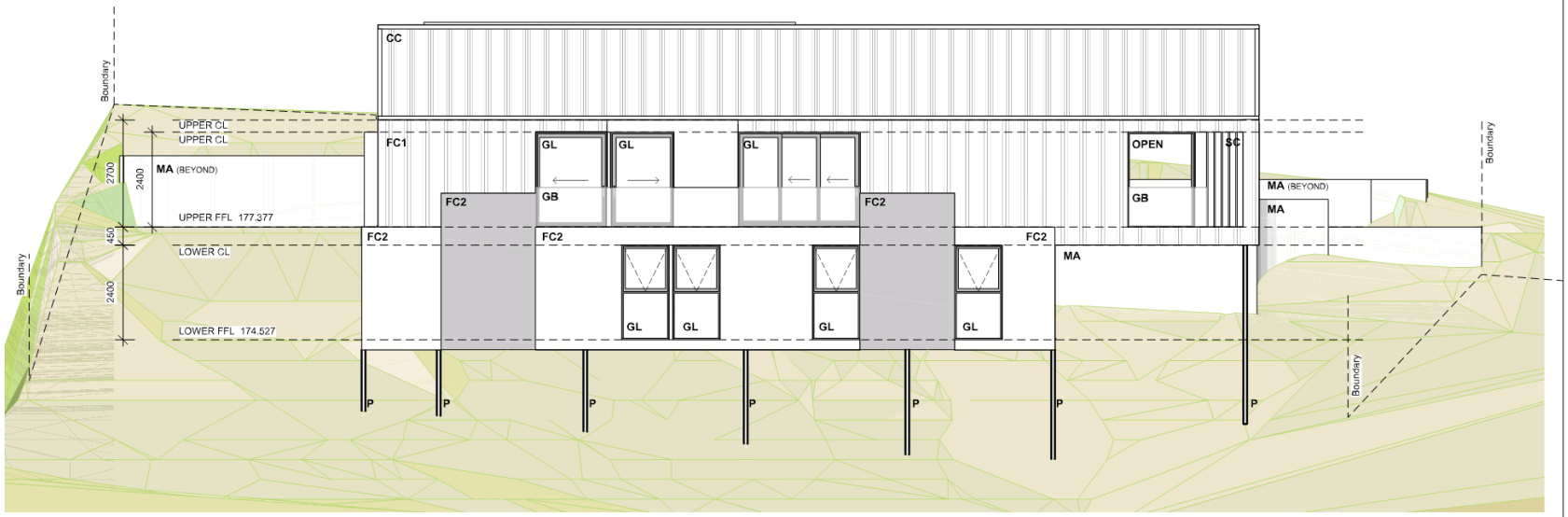
ISSUE
DATE
REVISION
PROJECT Rivulet House - 3 Erindale Place South Hobart
PROJECT # 1710
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 08-05-2018
DWG # DA- 105
SCALE @ A3 1:100
DWG Upper Floor Plan
DRAWN dlm
CHKD --
REVISION
Danny Leigh MacGregor Designs
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com

KEY

FC1 - FC SHEET CLADDING (SCYON AXON OR SIMILAR) PAINT FINISH TO MATCH EXISTING
FC2- FC SHEET CLADDING (SCYON MATRIX) EXPRESSED JOINT
SC - BATTEN SCREEN MODWOOD OR SIMILAR
GL - GLAZING
MA - BLOCKWORK MASONRY
GB - GLASS BALUSTRADE
CC - COLORBOND CLADDING (COLOUR AS SELECTED)
P - PAINTED STEEL POSTS
PD - PANEL LIFT DOOR



01 South Elevation
--- Scale 1:100

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ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1710
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 08-05-2018 — DWG # DA-201
SCALE @ A3 1:100
DWG: South Elevations
DRAWN dlm
CHKD --
REVISION

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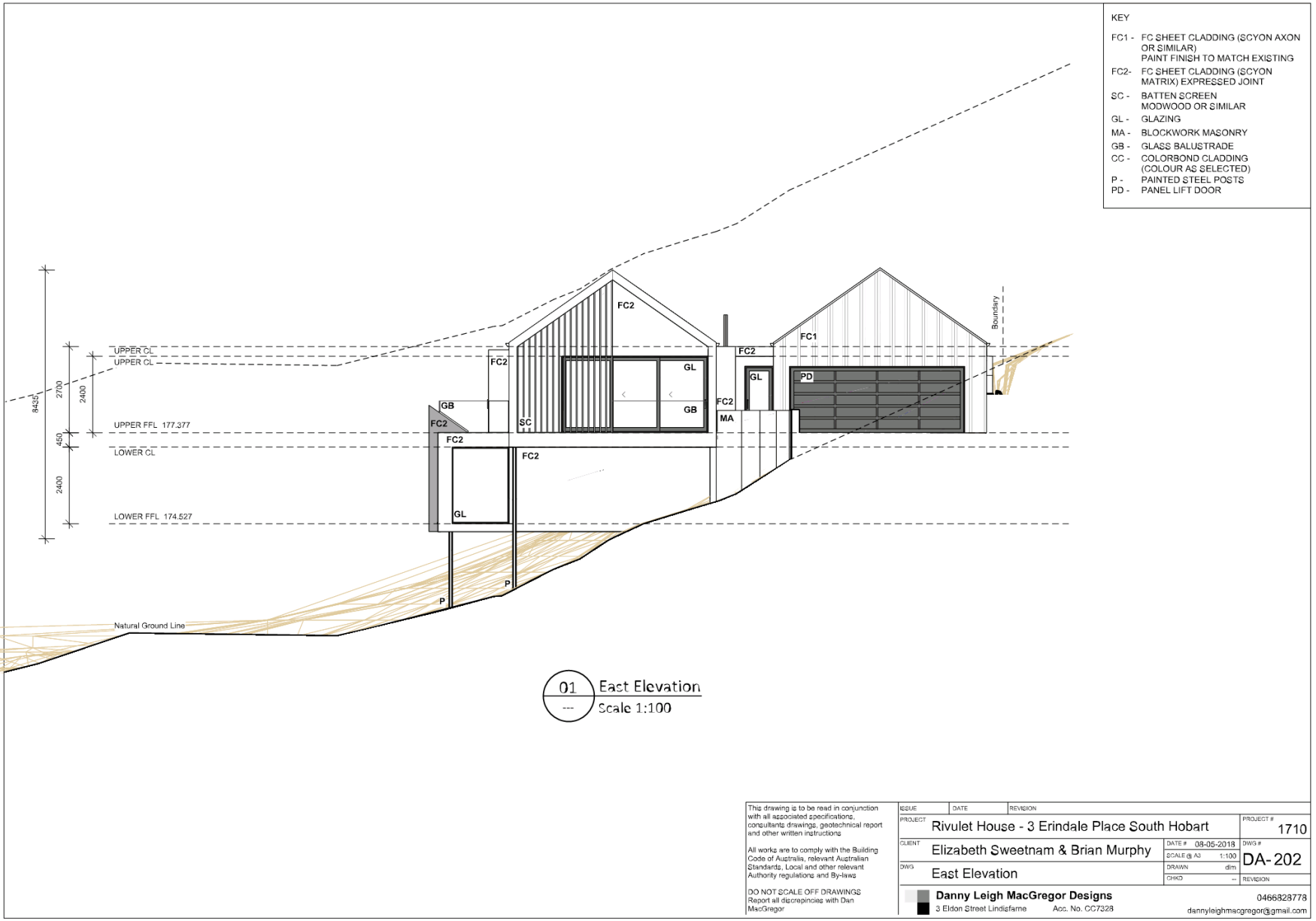
0466828778
dannyleighmacgregor@gmail.com


KEY
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FC2- FC SHEET CLADDING (SCYON MATRIX) EXPRESSED JOINT
SC - BATTEN SCREEN MODWOOD OR SIMILAR
GL - GLAZING
MA - BLOCKWORK MASONRY
GB - GLASS BALUSTRADE
CC - COLORBOND CLADDING (COLOUR AS SELECTED)
P - PAINTED STEEL POSTS
PD - PANEL LIFT DOOR
8425
2700
2400
450
2400
UPPER CL
UPPER CL
UPPER FFL 177.377
LOWER CL
LOWER FFL 174.527
Natural Ground Line
Boundary
FC1
FC2
GL
GB
SC
MA
PD
P
01 East Elevation
--- Scale 1:100
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PROJECT # 1710
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 08-05-2018
SCALE @ A3 1:100
DWG # DA-202
DWG East Elevation
DRAWN dlm
CHKD --
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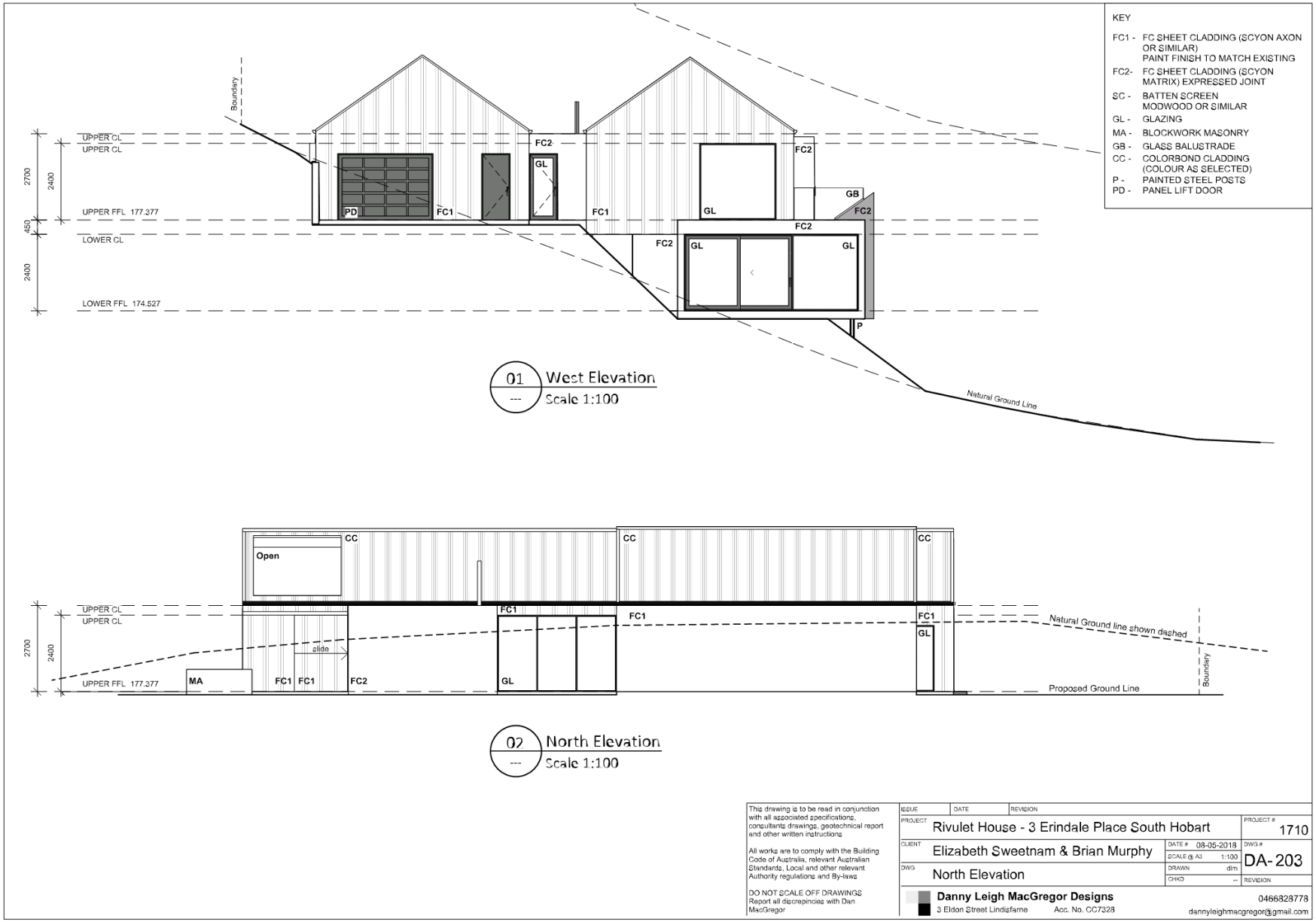
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SC - BATTEN SCREEN MODWOOD OR SIMILAR
GL - GLAZING
MA - BLOCKWORK MASONRY
GB - GLASS BALUSTRADE
CC - COLORBOND CLADDING (COLOUR AS SELECTED)
P - PAINTED STEEL POSTS
PD - PANEL LIFT DOOR
Boundary
UPPER CL
UPPER CL
UPPER FFL 177.377
LOWER CL
LOWER FFL 174.527
2700
2400
450
2400
FC1
FC2
GL
PD
GB
P
Natural Ground Line
01 West Elevation
Scale 1:100
CC
Open
slide
MA
Natural Ground line shown dashed
Proposed Ground Line
Boundary
02 North Elevation
Scale 1:100
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PROJECT # 1710
CLIENT Elizabeth Sweetnam & Brian Murphy
DATE # 08-05-2018
SCALE @ A3 1:100
DWG # DA-203
DWG North Elevation
DRAWN dlm
CHKD --
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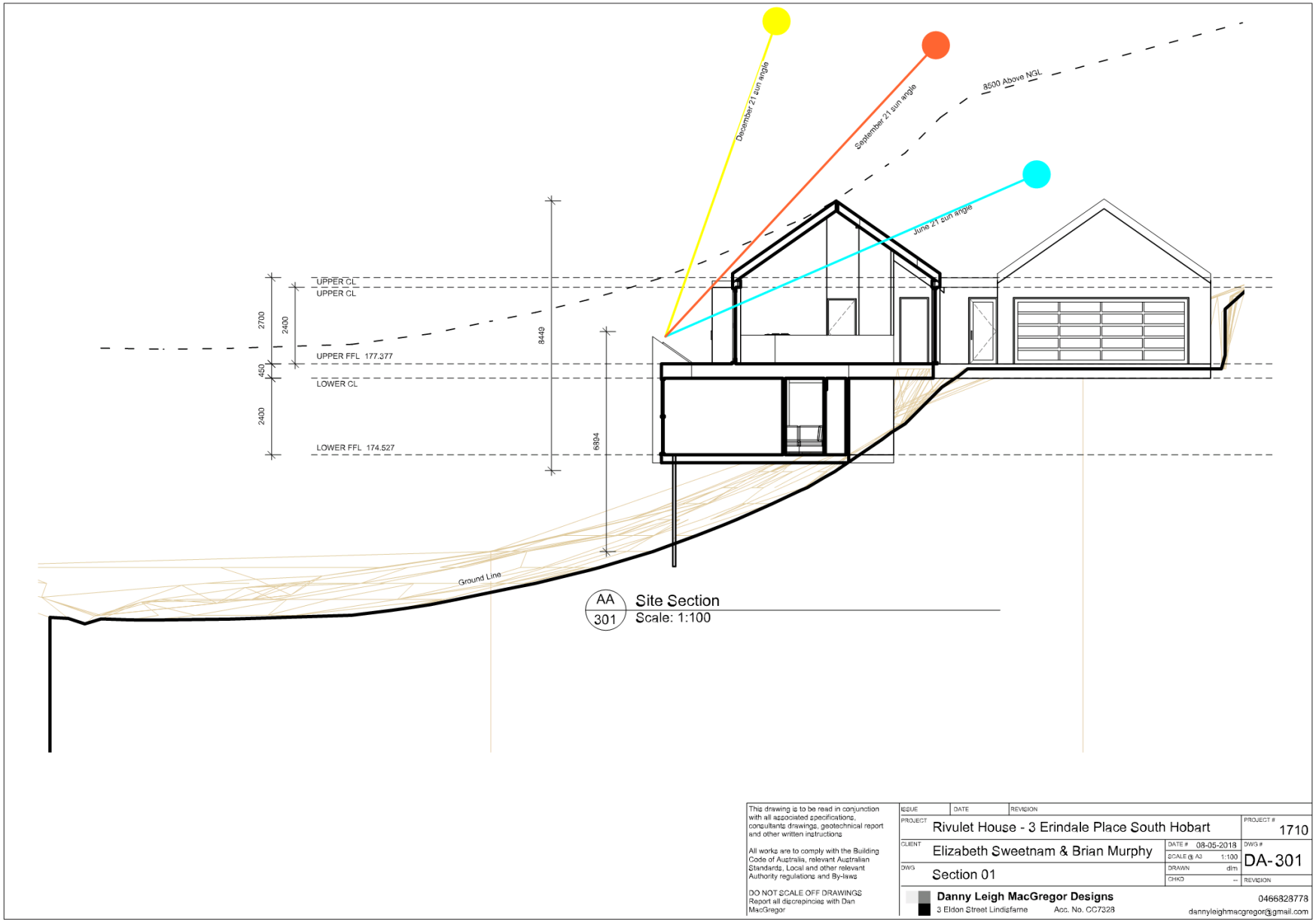

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ISSUE	DATE	REVISION

PROJECT: Rivulet House - 3 Erindale Place South Hobart — PROJECT # 1710
CLIENT: Elizabeth Sweetnam & Brian Murphy — DATE # 08-05-2018 — DWG # DA-301
DWG: Section 01 — SCALE @ A3 1:100 — DRAWN dlm — CHKD -- — REVISION

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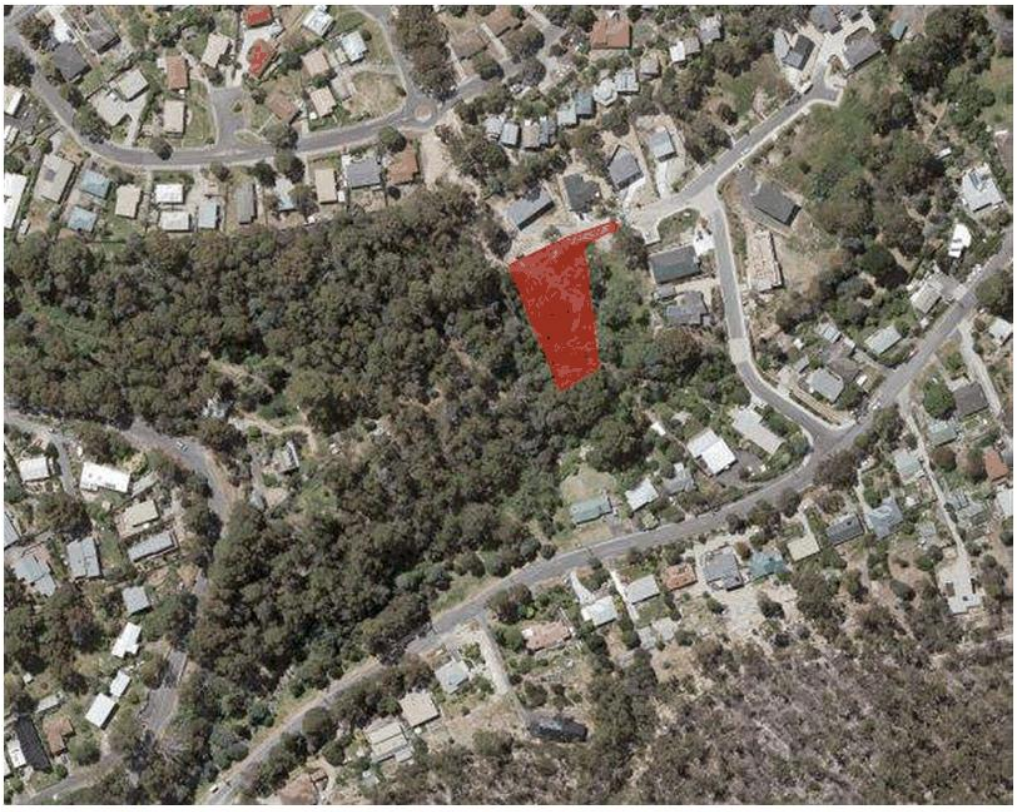
3 Eldon Street Lindisfarne Acc. No. CC7328
0466828778
dannyleighmacgregor@gmail.com

Hobart Building Assessment Services

Bushfire Attack Level Report and Hazard Management Plan –

3 Erindale Place, South Hobart



Prepared by:

Michael Westcott
Accredited Bushfire Practitioner BFP 131
Date 18.3.2018

583 Nelson Rd, Mt Nelson 7007 m 0407 796 978 e mike@hbas.com.au

Hobart Building Assessment Services

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Attachment 1: Bushfire Hazard Management Plan

Disclaimer:

AS 3959-2009 cannot guarantee that a dwelling will survive a bushfire attack, however the implementation of the measures contained within AS 3959-2009, this report and accompanying plan will improve the likelihood of survival of the structure. This report and accompanying plan are based on the conditions prevailing at the time of assessment. No responsibility can be accepted to actions by the land owner, governmental or other agencies or other persons that compromise the effectiveness of this plan. The contents of this plan are based on the requirements of the legislation prevailing at the time of report.

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Hobart Building Assessment Services

1. Summary:

This Bushfire Risk Assessment has been prepared to support the design and construction of a new dwelling at 3 Erindale Place, South Hobart. The site has been deemed to be bushfire prone due to its proximity to the area of bushfire prone vegetation on, as well as to the north and north east of the property.

This report has been prepared in conjunction with the design plans provided by the designer and this report must be read in conjunction with the specifications contained in those plans.

This report identifies the protective features and controls that must be incorporated into the construction works to ensure compliance with the standards. Fire management solutions are as defined in AS 3959-2009 Construction of Buildings in Bushfire Prone Areas, National Construction Code (Volume 2), E 1.0 Bushfire-Prone Areas Code and the Tasmania Fire Service publication Guidelines for Development in Bushfire Prone Areas 2005.

Provided construction standards for BAL 29 of AS 3959-2009 are incorporated into the new building works and the provision of the minimum defendable space specified in Table 1 and the Bushfire Hazard Management Plan being provided, the new building works are capable of compliance with the provisions of AS 3959-2009 and as a result, the bushfire risk is reduced.

Access to the site and water supply for fire fighting must comply with the requirements of Table 4.2 and Table 4.3A of the Directors Determination – Requirements for Building in Bushfire Prone Areas Version 2.1 dated 29 August 2017.

The effectiveness of the measures and recommendations detailed in this report and AS 3959-2009 are dependent on their implementation and maintenance for the life of the development or until the site characteristics that this assessment has been measured from alter from those identified. No liability can be accepted for actions by lot owners, Council or governmental agencies which compromise the effectiveness of this report.

This report has been prepared by Michael Westcott, Managing Director of Hobart Building Assessment Services. Michael is a building consultant in Tasmania and is accredited by the Tasmania Fire Service to prepare bushfire hazard management plans.

Site survey was carried out on 1st October 2017.

Hobart Building Assessment Services

2. Location:

Property Address:	3 Erindale Place, South Hobart
Owner:	Elizabeth Sweetnam & Bryan Murphy
Title Reference:	161337/4
PID No:	3099843
Municipality:	Hobart

Figure 1: Site Location (Source The LIST)

Hobart Building Assessment Services

3. Site Description

The property is situated at the end of Erindale Place, approximately 40 metres from the junction of Woodlyn Crescent and Erindale Place. The topography falls to the east at 6°. At the time of the assessment, vegetation to the west and south out to 100 metres from the proposed dwelling consisted of native eucalypt forest, however land to the north and east is considered managed.

There is a fire hydrant located on Erindale Place, within 120m of all sides of the proposed dwelling.

Planning controls are administered by Hobart City Council under the City of Hobart *Interim Planning Scheme 2016*. The site is zoned *General Residential.*

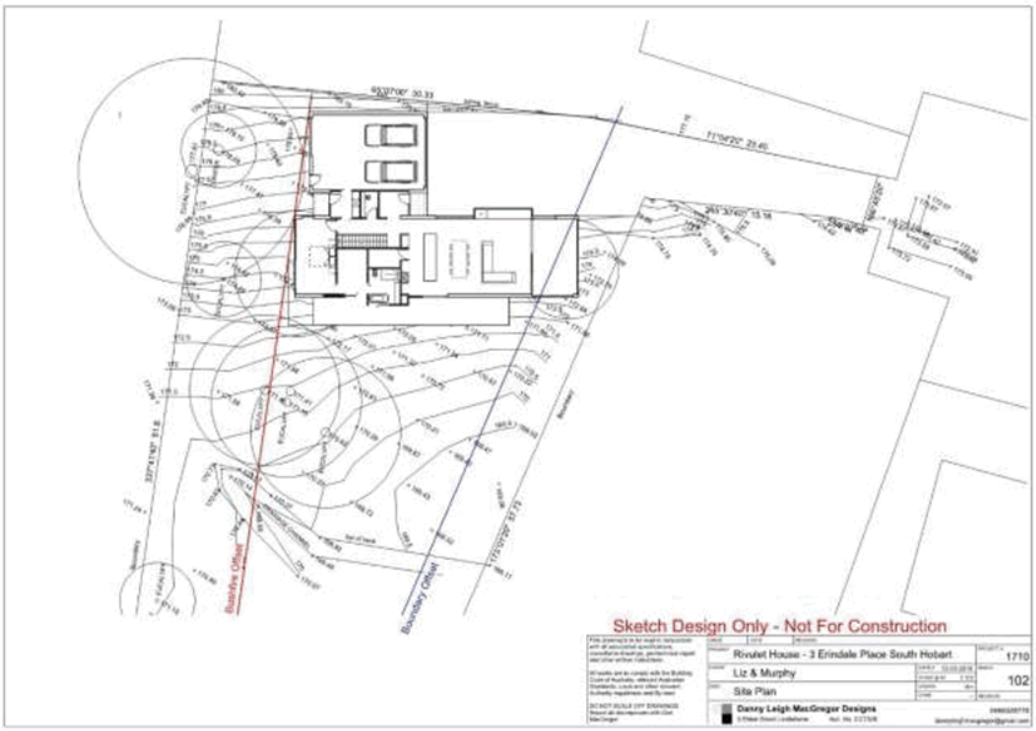

Figure 2: Site Plan

Hobart Building Assessment Services

4. Proposed Development:

A new dwelling is proposed for the site. Access to the dwelling is directly off Erindale Place.

Bushfire Attack Level (BAL)Assessment:

5. Bushfire Assessment:

Fire Danger Index (FDI): The fire Index Rating for Tasmania is adopted as 50.

Vegetation Classification:

The predominant vegetation has been determined follows;

North of development site:	Managed Land
East of development site:	Managed Land
South of development site:	Classification A: Forest
West of development site:	Classification A: Forest

Gradient under predominant vegetation:

North :	Upslope
East:	Downslope 6°
South:	Upslope
West:	Upslope

Distance to predominant vegetation:

North:	N/A
East:	N/A
South:	>16 metres
West:	16 metres

NOTE: Vegetation within the 100 metre assessment area to the south and west is unmanaged native trees and shrubs and has been assessed as **Classification A: Forest.**

Vegetation within the 100 metre assessment area to the north and east is managed residential land.

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Predominant vegetation to the north – Managed Land

Predominant vegetation to the east – Managed Land

583 Nelson Rd, Mt Nelson 7007 m 0407 796 978 e mike@hbas.com.au

Hobart Building Assessment Services

Predominant vegetation to the south – Classification A: Forest

Predominant vegetation to the west – Classification A: Forest

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Hobart Building Assessment Services

Bushfire Attack Level (BAL):

Based on the predominant vegetation detailed above, and the separation distance EXISTING between the predominant vegetation and the development, the BAL for each elevation of the proposed dwelling has been assessed as follows:

North elevation:	**BAL FZ**
East elevation:	**BAL FZ**
South elevation:	**BAL FZ**
West elevation:	**BAL FZ**

Table 1. Details the hazard management areas required to comply with that BAL, and the area available for compliance:

	North	East	South	West
BAL	BAL- 29	BAL- 29	BAL- 29	BAL- 29
Vegetation Type	Managed Land	G(i) Grassland	A: Forest	A: Forest
Slope	Downslope 6.7°	Downslope 6°	Upslope	Upslope
Hazard Management Area Required	N/A	N/A	16-<23 metres	16-<23 metres
Hazard Management Area Available	Area cleared and managed to boundary.	Area cleared and managed to boundary.	Area cleared and managed to 16 metres minimum from face of dwelling.	Area cleared and managed to 16 metres minimum from face of dwelling. Part 5 Agreement to be entered into with HCC to enable additional required 8 metre separation distance from boundary.

Table 1: BAL Assessment and Hazard Management Area Requirements

Hobart Building Assessment Services

6. Compliance:

All building works shall comply with the specifications for BAL 29 under Section 7 of AS 3959-2009.

Maintenance Requirements: Hazard Management Areas

	NORTH	EAST	SOUTH	SWEST
Hazard management area required	N/A	N/A	Minimum of 16 metres from face of building	Minimum of 16 metres from face of building
Management requirements	To the requirements of the Bushfire Hazard Management Plan (attached)	To the requirements of the Bushfire Hazard Management Plan (attached)	To the requirements of the Bushfire Hazard Management Plan (attached)	To the requirements of the Bushfire Hazard Management Plan (attached)

Table 2. Maintenance requirements for Hazard Management Areas

Provided the management practices as described above are implemented, they will achieve the required hazard management areas. The continuation of these practices are sufficient to comply with this assessment. Any alteration to the current management practices or vegetation surrounding the site, within the prescribed management areas must comply with the following:

- Establishing non-flammable areas around the dwelling such as paths, patios, driveways, lawns, etc.
- Locating dams, orchards, vegetable gardens, effluent disposal areas, etc on the bushfire prone side of the building.
- Providing heat shields and ember traps on the bushfire prone side of the dwelling such as non flammable fencing, hedges, separated garden shrubs and small trees. Avoid the use of highly flammable plants.
- Ensure flammable materials such as wood piles, fuels and rubbish heaps are stored away from the dwelling.
- Replace highly flammable plants with low flammability species.
- Provide horizontal separation between tree crowns and vertical separation between ground fuels and overhead branches.
- Provide separation between significant trees such that groups are no greater than 20 metres in width and more than 20 metres from other groups of significant trees. Note that retention of some trees can screen a dwelling from windborne embers.
- Regular slashing or mowing of grass to a height of less than 100mm.

Hobart Building Assessment Services

- Removal of ground fuels such as leaves, bark, fallen branches etc on a regular basis.
- Ensuring no trees overhang the dwelling so that vegetation falls onto the roof.

Compliance with the Directors Determination Version 2.1 – Requirements for Building in Bushfire Prone Areas is achieved through implementation of the following:

- **Table 4.2 Vehicular access:**
- The following design and construction requirements apply to property access:
- (a) All-weather construction;
- (b) Load capacity of at least 20 tonnes, including for bridges and culverts;
- (c) Minimum carriageway width of 4 metres;
- (d) Minimum vertical clearance of 4 metres;
- (e) Minimum horizontal clearance of 0.5 metres from the edge of the carriageway;
- (f) Cross falls of less than 3° (1:20 or 5%);
- (g) Dips less than 7° (1:8 or 12.5%) entry and exit angle;
- (h) Curves with a minimum inner radius of 10 metres;
- (i) Maximum gradient of 15° (1:3.5 or 28%) for sealed roads, and 10° (1:5.5 or 18%) for unsealed roads; and
- (j) Terminate with a turning area for fire appliances provided by one of the following:
- (i) A turning circle with a minimum outer radius of 10 metres;
- (ii) A property access encircling the building; or
- (iii) A hammerhead "T" or "Y" turning head 4 metres wide and 8 metres long.
- As the private access road services 3 or more properties, Passing bays of 2 metres additional carriageway width and 20 metres length must be provided every 100 metres.

The above requirements are not applicable to this property.

- **Table 4.3A Water supply:**
- **A. Distance between building area to be protected and water supply:**
- The following requirements apply:
- (a) The building area to be protected must be located within 120 metres of a fire hydrant; and
- (b) The distance must be measured as a hose lay, between the fire fighting water point and the furthest part of the building area.
- (b) No closer than six metres from the building area to be protected; (c) With a minimum width of three metres constructed to the same standard as the carriageway; and
- (d) Connected to the property access by a carriageway equivalent to the standard of the property access.

Hobart Building Assessment Services

- **7. Conclusions & Recommendations**

This Bushfire Risk Assessment and Bushfire Hazard Management Plan have been prepared support design and construction of a new dwelling at 3 Erindale Place, South Hobart. The report has reviewed the bushfire risks associated with the site and determined the fire management strategies that must be carried out to ensure the development on the site is at reduced risk from bushfire attack. Provided the elements detailed in this report are implemented, the development on the site is capable of compliance with AS-3959-2009 and the Tasmanian Fire Service Guidelines, any potential bushfire risk to the site is reduced.

The new building works must comply with the requirements for BAL 29 of AS-3959-2009 as specified in Table 1 and part 5 of this report. The Council approval issued for the building works should contain conditions requiring that the protective elements defined in this report and AS-3959-2009 are implemented during the construction phase and maintained by the Lot owners for the life of the structure.

Although not mandatory, any increase in the construction standards above the assessed Bushfire Attack Level will afford improved protection from bushfire and this should be considered by the owner, designer and/or builder prior to construction commencing.

Hazard Management Areas must be established and maintained in a minimal fuel condition in accordance with this plan and the TFS guidelines. It is the owners responsibility to ensure the long term maintenance of the hazard management areas in accordance with the requirements of this report.

This report does not recommend or endorse the removal of any vegetation within, or adjoining the site for the purpose of bushfire protection without the explicit approval of the local authority.

Michael Westcott
Bushfire Hazard Practitioner BFP – 131

583 Nelson Rd, Mt Nelson 7007 m 0407 796 978 e mike@hbas.com.au

Hobart Building Assessment Services

8. References

- Australian Standards, AS 3959-2009, Construction of buildings in bushfire-prone areas. Standards Australia Sydney NSW.
- Building Act 2016 (Tas.)
- Building Regulations 2014 (Tas).
- Building Regulations 2016 (Tas).
- Directors Determination – Requirements for Building in Bushfire - Prone Areas Version 2.1 29 August 2017
- Resource Management & Conservation Division of the Department Primary Industry & Water September 2006, TASVEG, Tasmanian Vegetation Map. Tasmania.
- Tasmanian Fire Service 2013, Building for Bushfires.
- Tasmanian Government, Land Information System Tasmania, www.thelist.tas.gov.au

Hobart Building Assessment Services

the LIST

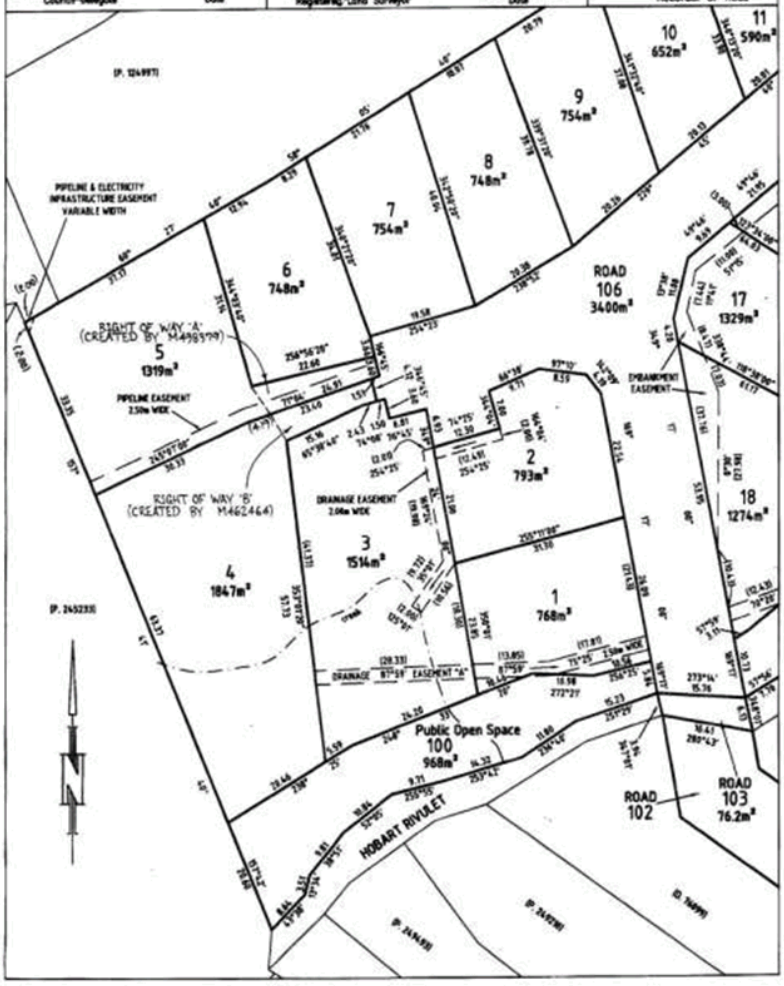
FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

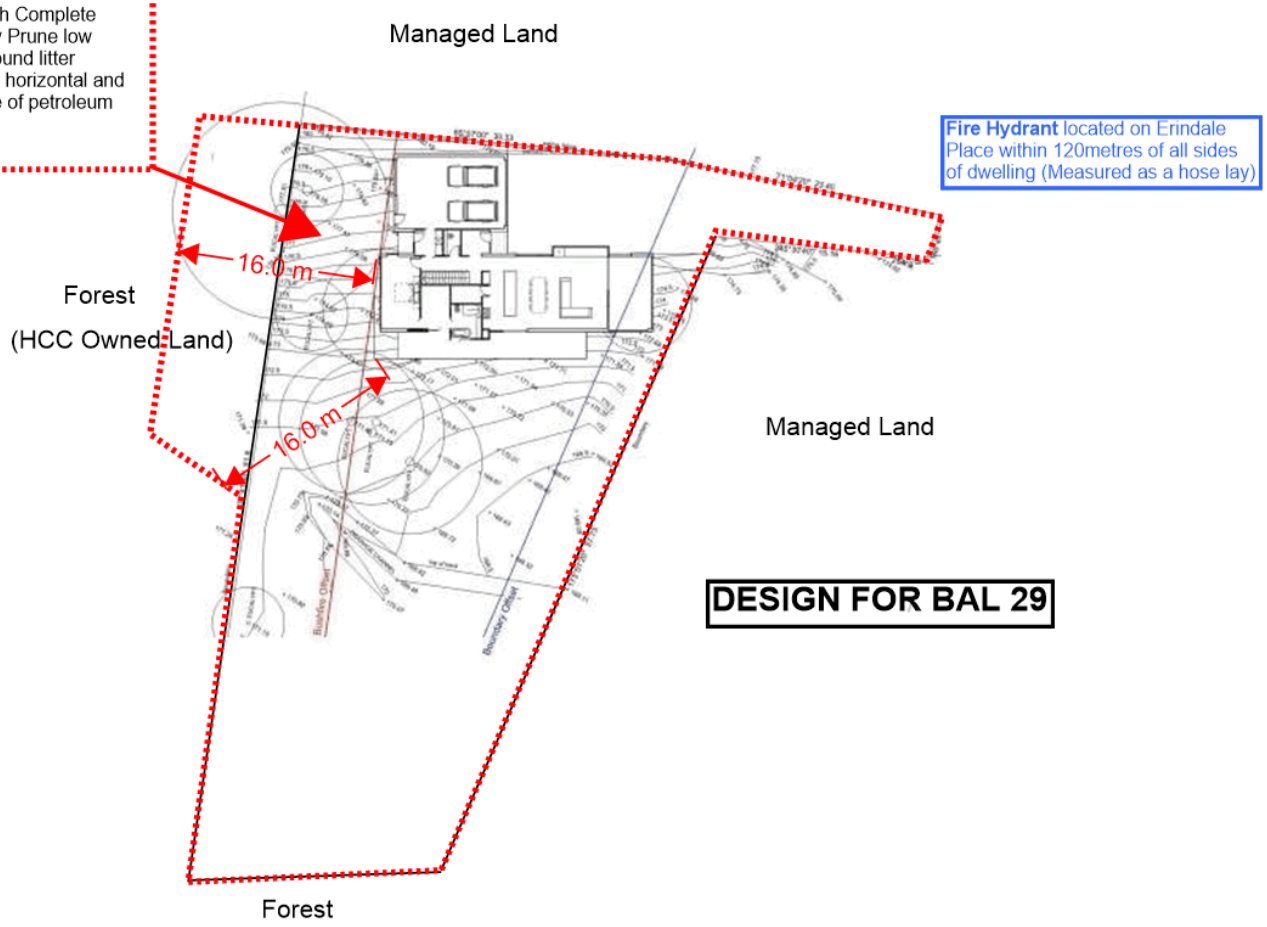
PLAN OF SURVEY ANNEXURE SHEET SHEET 1 OF 3 SHEETS	OWNER TODBER PTY LTD, STRATEDY PTY LTD & CASCADE BREWERY COMPANY PTY LTD FOLIO REFERENCE C.T. 148639/2, C.T. 149634/1 & C.T. 247207/1 SCALE 1: 500 LENGTHS IN METRES	Registered Number SP 161337
SIGNED FOR IDENTIFICATION PURPOSES Council Delegate 8.4.2011 Date	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED INDEX PLAN THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET Registered Land Surveyor 31/1/2011 Date	APPROVED EFFECTIVE FROM - 2 MAY 2011 Alice Kava Recorder of Titles



583 Nelson Rd, Mt Nelson 7007 m 0407 796 978 e mike@hbas.com.au

HAZARD MANAGEMENT AREAS -
Vegetation Management
Vegetation in the Hazard Management Area (as dimensioned and shown) is to be managed and maintained in a **MINIMUM FUEL CONDITION.**

Maintenance Schedule
Removal of fallen limbs, leaf bark & litter
Cut lawns short (less than 100mm) and maintain Remove pine bark and other flammable garden mulch Complete under-brushing and thin out the understorey Prune low hanging trees to ensure separation from ground litter
Prune larger trees to establish and maintain horizontal and vertical canopy separation Minimise storage of petroleum fuels.



3 Erindale Place,
South Hobart.
CT 161337/4
PID 3099843
Michael Westcott BFP - 131
Accredited scope of work:
1, 2 & 3A

Bush Fire Hazard Management Plan

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form **55**

To: Elizabeth Sweetnam & Bryan Murphy (Owner /Agent)
36 Adelaide St (Address)
South Hobart 7004 (Suburb/postcode)

Qualified person details:

Qualified person: Michael Westcott
Address: 583 Nelson Rd
Mount Nelson TAS 7007
Phone No: 0407 796 978
Fax No:
Licence No: BFP - 131
Email address: mike@hbas.com.au

Qualifications and Insurance details: Accredited to report on bushfire hazards under Part IVA of the *Fire Services Act 1979*.
PI Insurance LLOYDS Australia Limited.
Policy # AD451001413PI
(description from Column 3 of the Director of Building Control's Determination)

Speciality area of expertise: Analysis of hazards in bushfire-prone areas.
(description from Column 4 of the Director of Building Control's Determination)

Details of work:

Address: 3 Erindale Place
South Hobart 7004
Lot No: 4
Certificate of title No: 161337

The assessable item related to this certificate: New Dwelling
(description of the assessable item being certified)
Assessable item includes –
- *a material,*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: Licensed person - bushfire hazard
(description from Column 1 of Schedule 1 of the Director of Building Control's Determination)

This certificate is in relation to the above assessable item, at any stage, as part of - *(tick one)*

building work, plumbing work or plumbing installation or demolition work: X

or

a building, temporary structure or plumbing installation: ☐

In issuing this certificate the following matters are relevant –

Documents:	BAL Report & Bushfire Hazard Management Plan – 3 Erindale Place, South Hobart TAS 7004
Relevant calculations:	
References:	Determination, Director of Building Control Requirements for Building in Bushfire-Prone Areas, version 2.1 29 August 2017. Consumer, Building and Occupational Services, Department of Justice, Tasmania. Building Amendment (Bushfire-Prone Areas) Regulations 2014 Standards Australia 2009, Construction of buildings in bushfire prone areas, 3rd ed. incorporating amendments 1, 2 and 3, Standards Australia, Sydney.

Substance of Certificate: (what it is that is being certified)

BAL Report & Bushfire Hazard Management Plan – 3 Erindale Place, South Hobart TAS 7004.

Scope and/or Limitations

I certify the matters described in this certificate.

	Signed:	*Certificate No:*	*Date:*
Qualified person:		59/1718	18.3.2018

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

OWNER TODBER PTY LTD, STRATEGY PTY LTD & CASCADE BREWERY COMPANY PTY LTD
FOLIO REFERENCE C.T. 146939/2, C.T.149634/1 & C.T. 247207/96
GRANTEE PART OF 2000 ACRES GTD TO PETER DEGRAVES, ~~PART OF 2000 ACRES GTD TO JOSEPH ALLPORT & THOMAS YOUNG, PART OF 0A-1R-0P & WHOLE OF 0A-1R-30P GTD TO JOSEPH ALLPORT & HENRY STEVENSON HURST AND PART OF 0A-1R-16P & WHOLE OF 0A-0R-0P GTD TO HENRY DEGRAVES~~

PLAN OF SURVEY

BY SURVEYOR CRAIG BRADLEY ROGERSON
ROGERSON & BIRCH SURVEYORS
UNIT 1B 120 CAMBRIDGE ROAD ROSNY PARK
PH 6244-6256 FAX 6244-6221 MOB. 0418-120-796

LOCATION CITY OF HOBART

SCALE 1: 1000 LENGTHS IN METRES

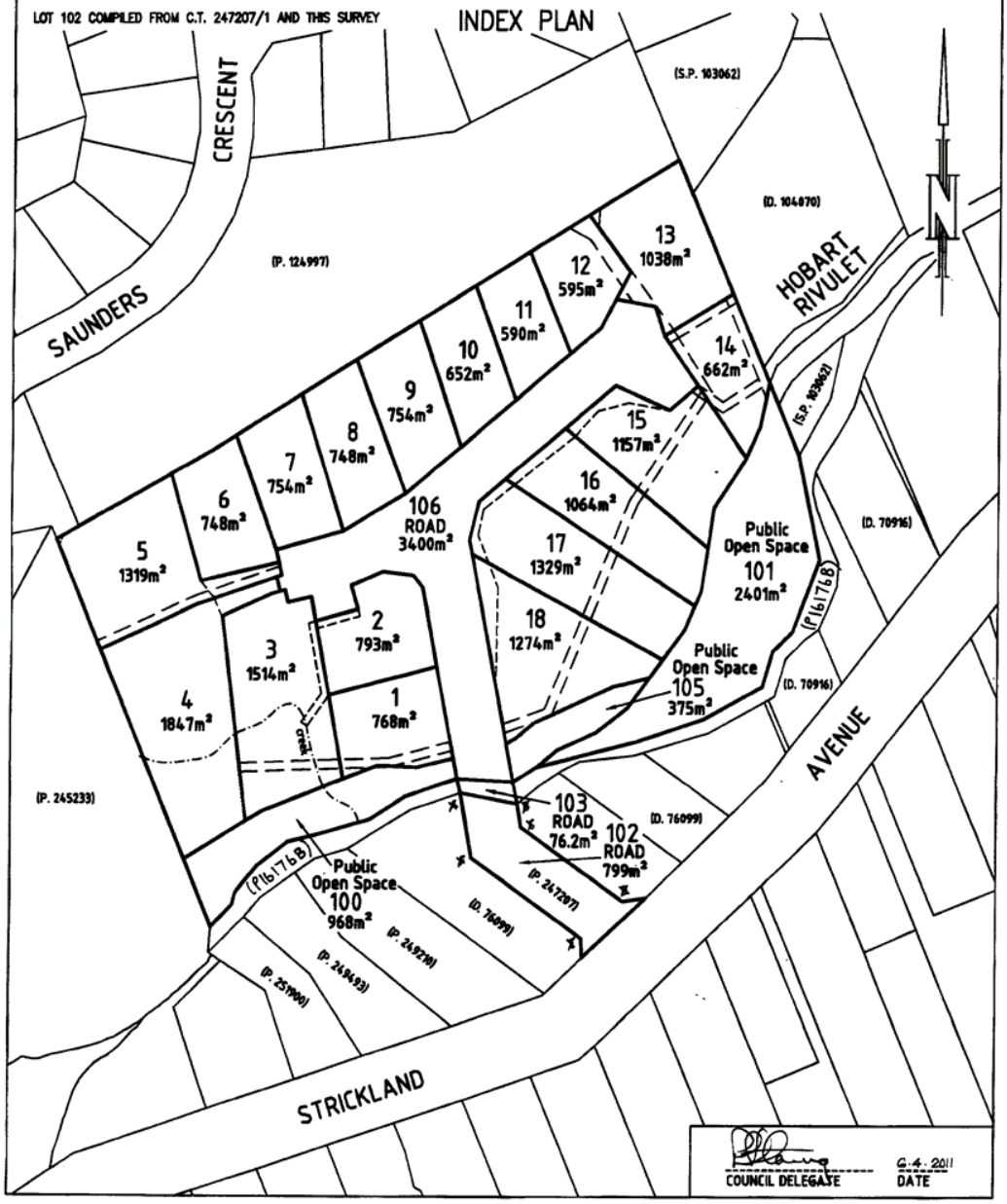
REGISTERED NUMBER **SP161337**

APPROVED EFFECTIVE FROM - 2 MAY 2011
Alice Kawa Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 114 (5224-11)
LAST UPI No. GPX17 GLCD6
LAST PLAN No. P.146939 P.149634
ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

LOT 102 COMPILED FROM C.T. 247207/1 AND THIS SURVEY

INDEX PLAN

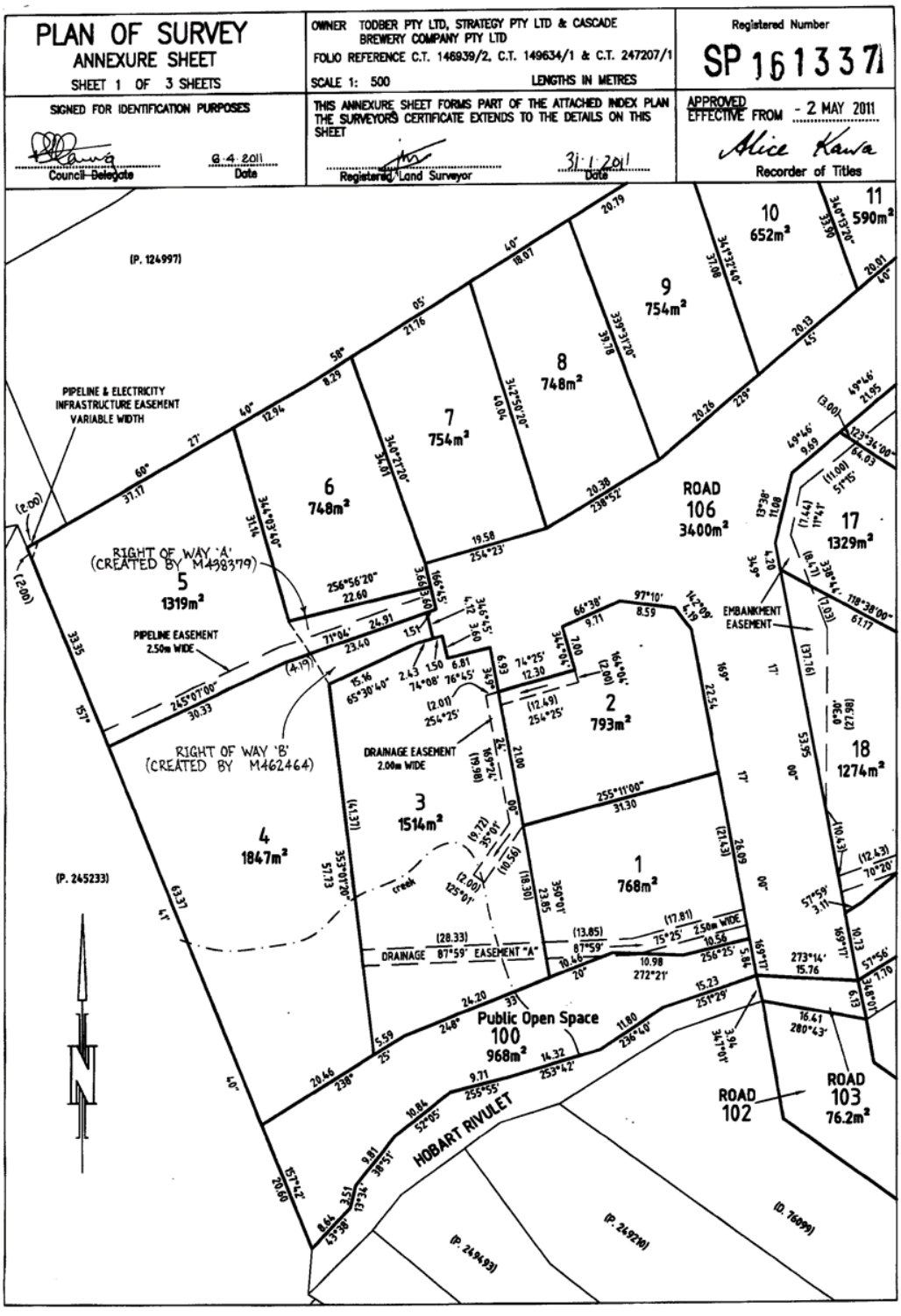


FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government



FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

PLAN OF SURVEY
ANNEXURE SHEET
SHEET 2 OF 3 SHEETS

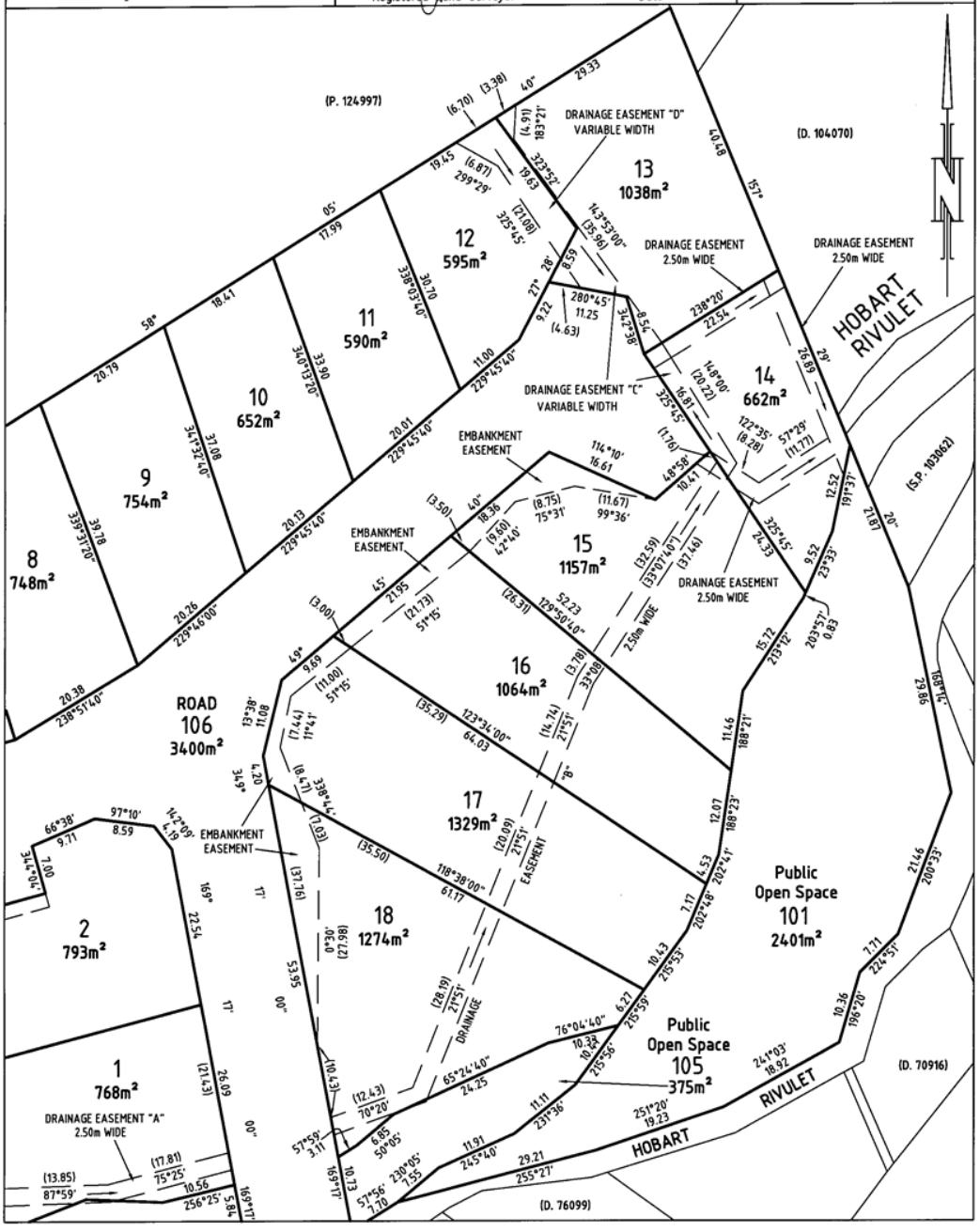
OWNER TODBER PTY LTD, STRATEGY PTY LTD & CASCADE BREWERY COMPANY PTY LTD
FOLIO REFERENCE C.T. 146939/2, C.T. 149634/1 & C.T. 247207/1
SCALE 1: 500 LENGTHS IN METRES

Registered Number
SP 161337

SIGNED FOR IDENTIFICATION PURPOSES
Council Delegate 6.4.2011 Date

THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED INDEX PLAN THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET
Registered Land Surveyor 31.1.2011 Date

APPROVED EFFECTIVE FROM - 2 MAY 2011
Alice Kava Recorder of Titles



FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

PLAN OF SURVEY ANNEXURE SHEET SHEET 3 OF 3 SHEETS	OWNER TODBER PTY LTD, STRATEGY PTY LTD & CASCADE BREWERY COMPANY PTY LTD FOLIO REFERENCE C.T. 146939/2, C.T. 149634/1 & C.T. 247207/1 SCALE 1: 500 LENGTHS IN METRES	Registered Number SP 161337
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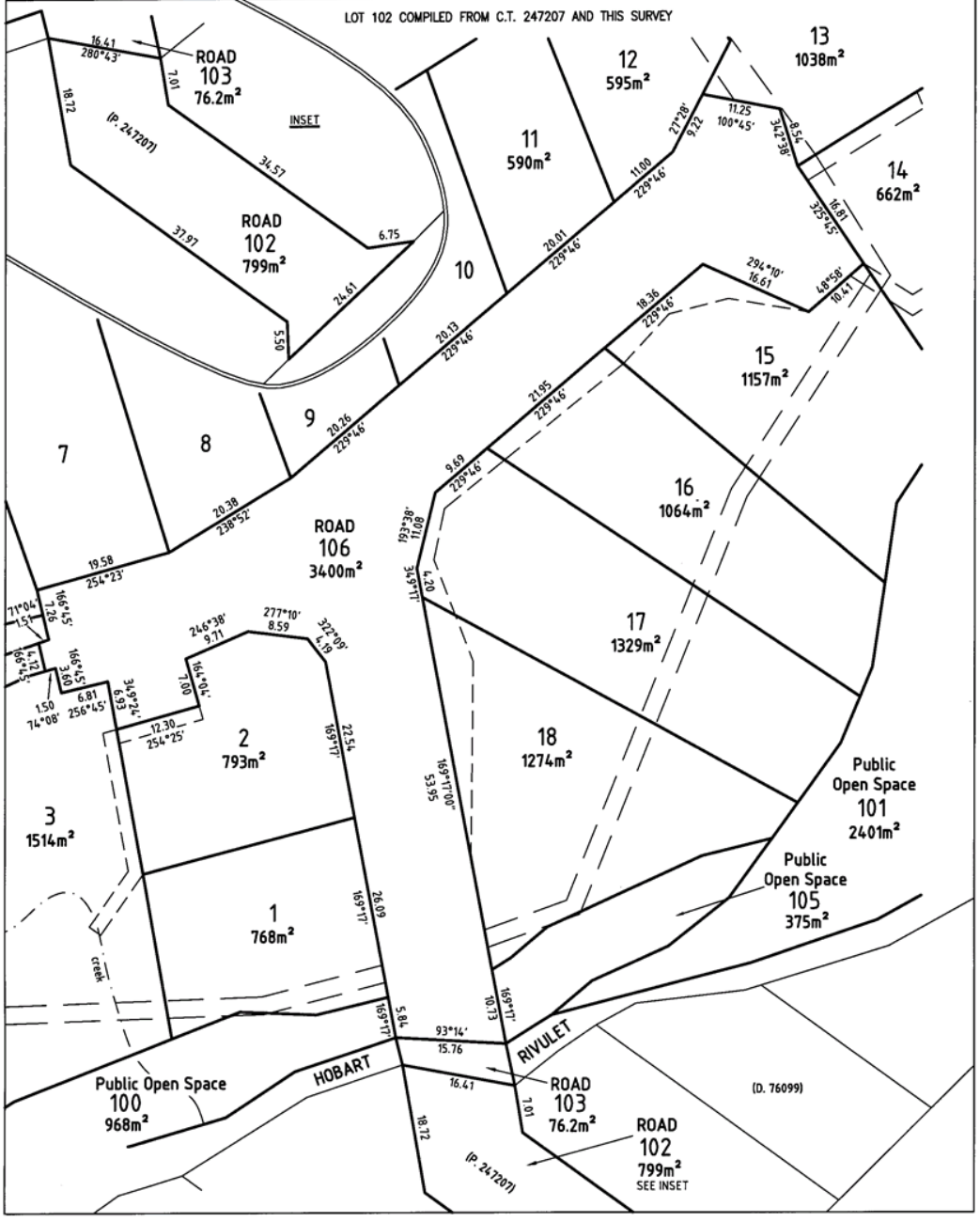

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
161337	4
EDITION	DATE OF ISSUE
4	12-May-2015

SEARCH DATE : 03-Jul-2018
SEARCH TIME : 11.44 AM

DESCRIPTION OF LAND

City of HOBART
Lot 4 on Sealed Plan 161337
Derivation : Part of 2000 Acres Gtd. to Peter Degraves
Prior CT 146939/2

SCHEDULE 1

D159073 TRANSFER to ELIZABETH HELEN SWEETNAM and BRYAN JOHN MURPHY as tenants in common in equal shares Registered 12-May-2015 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP161337 EASEMENTS in Schedule of Easements
SP161337 COVENANTS in Schedule of Easements
SP161337 FENCING PROVISION in Schedule of Easements
M462464 BURDENING EASEMENT: a right of carriageway (appurtenant to Lot 3 on Sealed Plan 161337) over the Right of Way 'B' on Sealed Plan 161337 Registered 25-Jul-2014 at noon
C935042 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 14-Oct-2009 at noon
E4782 MORTGAGE to National Australia Bank Limited Registered 12-May-2015 at 12.01 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SCHEDULE OF EASEMENTS	Registered Number
NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.	SP 161337

PAGE 1 OF 9 PAGE/S

EASEMENTS AND PROFITS

Each lot on the plan is together with:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
(2) any easements or profits a prendre described hereunder.
Each lot on the plan is subject to:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
(2) any easements or profits a prendre described hereunder.
The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

~~**Right of Carriageway**~~

~~Each and every Lot on the Plan is together with a right of carriage way over the right of way marked "ABCDEF" on P. 146939.~~

Burdening Easement

Each and every Lot on the Plan is subject to a burdening easement (to the extent that the below mentioned pipe traverses across that Lot) being the right of the Cascade Brewery Company Limited to have their three inch water pipe which runs from the Hobart Rivulet to the Cascade Brewery and passes through the Lots on the Plan, and maintained as at present with full rights of ingress, egress and regress for the purposes of renewing the same.

Pipeline Easement

Lot 5 is subject to a Pipeline Easement (appurtenant to Southern Water) over "PIPELINE EASEMENT 2.50 WIDE" shown passing through **Lot 5** on the Plan.

(USE ANNEXURE PAGES FOR CONTINUATION)

SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REF: CT 146939/2, 247207/6 & 149634/1 SOLICITOR & REFERENCE: C Wootton - 094186CNW	PLAN SEALED BY: Hobart City Council DATE: 6·4·2011 REF NO. 843·27 ~~Council Delegate~~ MANAGER SURVEYING SERVICES

NOTE: The Council Delegate must sign the Certificate for the purposes of identification.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 2 OF 9 PAGES	Registered Number SP161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

Pipeline & Electricity Infrastructure Easement

Lot 5 is subject to a Pipeline Easement and Electricity Infrastructure Easement (appurtenant to Southern Water and Aurora Energy Pty Ltd) over 'PIPELINE & ELECTRICITY INFRASTRUCTURE EASEMENT VARIABLE WIDTH" shown on **Lot 5** on the Plan.

Drainage Easements

Lot 1, ~~and~~ **Lot 3** and **Lot 100** on the Plan are subject to a right of drainage (appurtenant to Southern Water) over 'DRAINAGE EASEMENT "A" 2.50m WIDE' shown passing through the said lots on the Plan.

Lot 2 and **Lot 3** are subject to a right of drainage (appurtenant to the Hobart City Council) over "DRAINAGE EASEMENT 2.00m WIDE" shown passing through **Lot 2** and **Lot 3** on the Plan.

Lots ~~14~~, 15, 16, 17, ~~and~~ 18 and **Lot 105** on the Plan are subject a right of drainage (appurtenant to Southern Water) over 'DRAINAGE EASEMENT "B" 2.50m WIDE' shown passing through the said lots on the Plan.

Lot 13 and **Lot 14** on the Plan are subject to a right of drainage (appurtenant to Southern Water and Hobart City Council) over 'DRAINAGE EASEMENT "C" VARIABLE WIDTH' shown passing through the said lots on the Plan.

Lot 12 and **Lot 13** on the Plan are subject to a right of drainage (appurtenant to Southern Water and Hobart City Council) over 'DRAINAGE EASEMENT "D" VARIABLE WIDTH' shown passing through the said lots on the Plan

Lot 14 on the Plan is subject to a right of drainage (appurtenant to Southern Water) over "DRAINAGE EASEMENT 2.50m WIDE" shown running parallel to boundary line between **Lots 13** and **14** on the Plan.

Lot 14 is subject to a right of drainage (appurtenant to Hobart City Council) over "DRAINAGE EASEMENT 2.50m WIDE" shown running parallel with the eastern boundary line of **Lot 14** on the Plan.

Lot 14 and **Lot 15** on the Plan are subject to a right of drainage (appurtenant to Hobart City Council) over "DRAINAGE EASEMENT 2.50m WIDE" shown passing from the north eastern corner of **Lot 15** to the eastern boundary of **Lot 14** on the Plan.

R.K. Dudfield

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 3 OF 9 PAGES	Registered Number SP 161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

Embankment Easement

Lots 15, 16 , 17 and **18** on the Plan are subject to an Embankment Easement (appurtenant to the Hobart City Council) over the areas marked 'EMBANKMENT EASEMENT' on the said lots on the Plan.

Restrictive Covenant

The owners of **Lots 1, 3, 4, 14, 15, 16 , 17** and **18** on the Plan covenant with the Hobart City Council to the intent that the burden of the covenant may run with and bind the covenantor's lot and any part thereof and the benefit shall be in favour of the Hobart City Council, to observe the following stipulation:

(1) Not without the written consent of the Hobart City Council to erect or permit to be erected on the said lots any building structure or carry out and landscaping that may change the contours of the land or restrict the free flow of water over the land or cause erosion within 10 metres of the top of the bank of the existing course of the Hobart Rivulet.

The owners of **Lot 100** and **Lot 105** on the Plan covenant with the Hobart City Council to the intent that the burden of the covenant runs with and binds the covenantor's Lot and any part thereof and the benefit shall be in favour of the Hobart City Council to observe the stipulation:

(1) Not to erect or permit to be erected any building or buildings on the said Lots.

The owners of **Lot 1** on the Plan covenant with the Hobart City Council to the intent that the burden of the covenant may run with and bind the covenantor's lot and any part thereof and the benefit shall be in favour of the Hobart City Council, to observe the following stipulation:

1. Not to erect or construct any building or structure on the said lot without first obtaining a geotechnical assessment of any works proposed over any area of the lot which may have formed a part of the tributary course of the Hobart Rivulet.

Fencing Provision

In respect of any Lot on the Plan, the Vendors (Todber Pty Ltd & Strategy Pty Ltd) shall not be required to fence.

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 4 OF 9 PAGES	Registered Number SP161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

Interpretation

"Southern Water" means Tasmanian Water and Sewerage Corporation (Southern Region) Pty Limited, trading as Southern Water, established under the provisions of the Water and Sewerage Corporations Act 2008 (Tas).

"Embankment Easement" means the full and free right and liberty for the dominant tenement for the time being having the benefit of the easement over the lot(s) shown on the Plan to enter upon the land to carry out any works from time to time that may be necessary to retain and maintain the earthworks and drainage associated with a local highway as defined by the Local Government (Highways) Act 1982, but not precluding the servient tenement(s), subject to approval of the Local Authority, from constructing or erecting any structure on the land as required to provide access to any part of, or to maintain the stability of the servient lot(s.)

"Aurora Energy Pty Ltd" means Aurora Energy Pty Ltd, ABN 85 082 464 622

PIPELINE EASEMENT

"Easement Land" means Lot 5 on the Plan

"Transferee means Southern Water

"Transferor" means the registered proprietor for the time being of Lot 5

"Pipeline Easement" means the full right and liberty for the Transferee at all times to:

a) enter upon the Easement Land with employees, contractors, agents and all other persons duly authorised by it and with machinery, vehicles, plant and equipment; and

b) open, break up and excavate the Easement Land to lay and maintain on or in the Easement Land, sewer pipes, water pipes, valves and fittings for any purposes the Transferee may deem necessary; and

c) run and pass sewerage and water through and along the same and from time to time to inspect, cleanse, repair and maintain the same and when and where necessary to lay new pipes, valves and fittings in substitution for and in addition to any other pipes, valves and fittings; and

d) do all necessary works in connection with such activities or as may be authorised by any legislation:-

x R.K. Duffield x

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 5 OF 9 PAGES	Registered Number SP161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

i) without doing unnecessary damage to the Easement Land; and

ii) leaving the Easement Land in a clean and tidy condition.

PROVIDED ALWAYS THAT:

e) The Transferor must not without the written consent of the Transferee first had and obtained and only in compliance with the conditions which form the consent (if any):-

i) alter or permit to be altered the ground level of the Easement Land;

ii) erect or permit to be erected any building, structure, pipeline, paving, tree, shrub or other object on or in the Easement Land;

iii) remove any soil, rock or other matter that supports, protects or covers any works of the Transferee on or in the Easement Land;

iv) do or permit to be done any manner of thing which shall damage or contribute to damage or be likely to cause or contribute to damage to the sewer pipes, water pipes, valves and fittings laid now or later or constructed in or on the Easement Land; or

v) in any way prevent or interfere with the proper exercise and benefit of this easement by the Transferee or its employees, contractors, agents and all other persons duly authorised by it.

f) The Transferee is not required to fence any part of the Easement Land.

g) The Transferor shall be at liberty to erect any fence across the Easement Land wherever it may reasonably require the same provided that:

i) the Transferee shall be at liberty to provide in such a fence a gate suitable to its purposes; and

ii) the Transferor shall provide the Transferee with a key to any lock which would prevent the opening of any gate so provided.

x R.K. Dudfield x

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 6 OF 9 PAGES	Registered Number SP161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

h) In the event that the Transferor causes damage to any sewerage or water pipes, valves or fittings laid, maintained or substituted by the Transferee such that the Transferee is required to repair such damage, the Transferor shall be liable for the actual costs of the repair of the water pipes, valves and fittings so damaged.

i) The Transferee shall be at liberty without forfeiting any right of action, damages or otherwise against the Transferor to reinstate any alteration to the ground level and to remove from the Easement Land any building, structure, pipeline, paving, tree, shrub or other object or replace ant soil, rock or other matter that supported, protected or covered by works of the Transferee on or in the Easement Land which contravenes the provisions of this easement and shall not be required to replace or remove the same.

j) The Transferee with employees, contractors, agents and all other persons duly authorised by it and with machinery, vehicles, plant and equipment shall be at liberty to access and enter upon the Easement Land for the purposes of this Easement, such access to be from the road frontage or from any gate.

k) The Transferee shall be permitted to access the Easement land from the adjoining land of the Transferor provided that in doing so no damage or inconvenience is caused.

l) The Transferor shall not place any obstruction which would prevent access to the Easement Land.

x R.K. Oudfield x

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 7 OF 9 PAGES	Registered Number SP 161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

"Electricity Infrastructure Easement"

FIRSTLY the full and free right and liberty for Aurora Energy Pty Ltd and its successors and their servants agents and contractors at all times hereafter:-

(a) to clear the land marked "Pipeline and Electricity Infrastructure Easement' on the Plan (herein after called the Servient Land) and to erect construct, place, inspect, alter and repair, renew, maintain and use in upon and over and along and remove from the Servient Land towers poles, wires, cables, apparatus, appliances and other ancillary works (all of which are hereinafter collectively referred to as "the said lines") for the transmission and distribution of electrical energy and for purposes incidental thereto;

(b) to cause or permit electrical energy to flow or be transmitted through and along the said lines;

(c) to cut away remove and keep clear of the said lines all trees and all other obstructions or erections of any nature whatsoever which may at any time overhang, encroach or be in or on the Servient land and which may in any way endanger or interfere with the proper operation of the said lines; and

(d) To enter into and upon the Servient land for all or any of the above purposes with or without all necessary plant, equipment, machinery and vehicles of every kind, and making good all damage occasioned thereby.

SECONDLY the benefit of a covenant for Aurora Energy Pty Ltd and its successors with the registered proprietors for themselves and their successors in title of the Servient land not to erect any buildings or place any structures, objects or vegetation that could interfere with the proper and safe operation of the said lines to the intent that the burden of the covenant may run with and bind the Servient Land and every part thereof and that the benefit thereof may be annexed to the easement first hereinbefore described.

R.K. Dudfield

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SIGNED BY Todber Pty Ltd, ACN 008 139 268, in accordance with Section 127 of the *Corporations Act* 2001:

Director/Secretary

GRAHAM WILLIAM HOBBS.
Print Full Name

Director/Secretary

CAROLINE BEESTON
Print Full Name

SIGNED BY Strategy Pty Ltd, ACN 007 943 839, in accordance with Section 127 of the *Corporations Act* 2001:

Director/Secretary

ROGER MICHAEL PITT
Print Full Name

Director/Secretary

Jeeanne Gloria Pitt
Print Full Name

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

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ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 9 OF 9 PAGES	Registered Number SP161337
SUBDIVIDER: Todber Pty Ltd, Strategy Pty Ltd & Cascade Brewery Company Pty Ltd FOLIO REFERENCE: 146939/2, 149634/1 & 247207/6	

SIGNED BY Cascade Brewery Company Pty Ltd, ACN 058 152 195, in accordance with Section 127 of the *Corporations Act* 2001:

Director/Secretary

PAUL DAVID CONROY

Print Full Name

R.K. Dudfield

Director/Secretary

ROBERT KEITH DUDFIELD

Print Full Name

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

OS D 435

ANNEXURE TO **CERTIFICATE OF TITLE FOLIO OF REGISTER**

VOL. 4392 FOL. 3

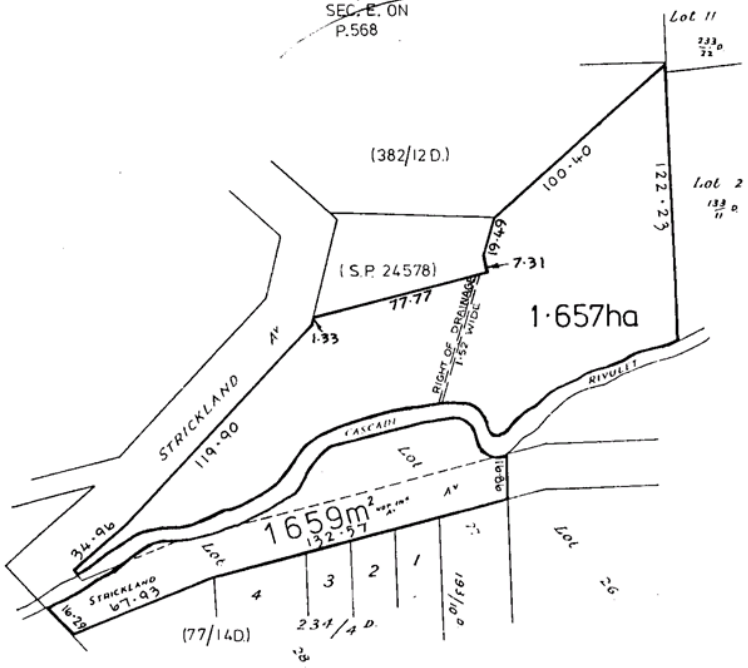
REGISTERED NUMBER

245233

Acting Recorder of Titles

Lots 1 - 2 of this plan consists of all the land comprised in the above-mentioned cancelled folio of the Register.

HOBART
MEAS. IN METRES
SEC. E. ON
P.568



RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
245233	1
EDITION	DATE OF ISSUE
1	23-Jul-1997

SEARCH DATE : 28-Nov-2018
SEARCH TIME : 10.50 AM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Plan 245233
Derivation : Part of 2000 acres Gtd to P Degraves.
Prior CT 4392/3

SCHEDULE 1

HOBART CITY COUNCIL

SCHEDULE 2

Reservations and conditions in the Crown Grant if any

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

SURVEY NOTES

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SURVEY INFORMATION ONLY SURVEY NOTES DEPOSITED FOR PUBLIC RECORD (SEE LTO CIRCULAR 1 OF 2007)	MAIN L.T.O. PLAN (TO BE FILED WITH) P. 245233
PURPOSE: PARTIAL REMARK	SIO REFERENCE 168770

LOCATION: 163 STRICKLAND AVENUE, HOBART

OWNER: HOBART CITY COUNCIL

FOLIO REFERENCE: C.T. 245233/1

GRANTEE: PART OF 2000 ACRES GTD. TO P.DEGRAVES

LENGTHS IN METRES

SURVEYORS REF No: 160950

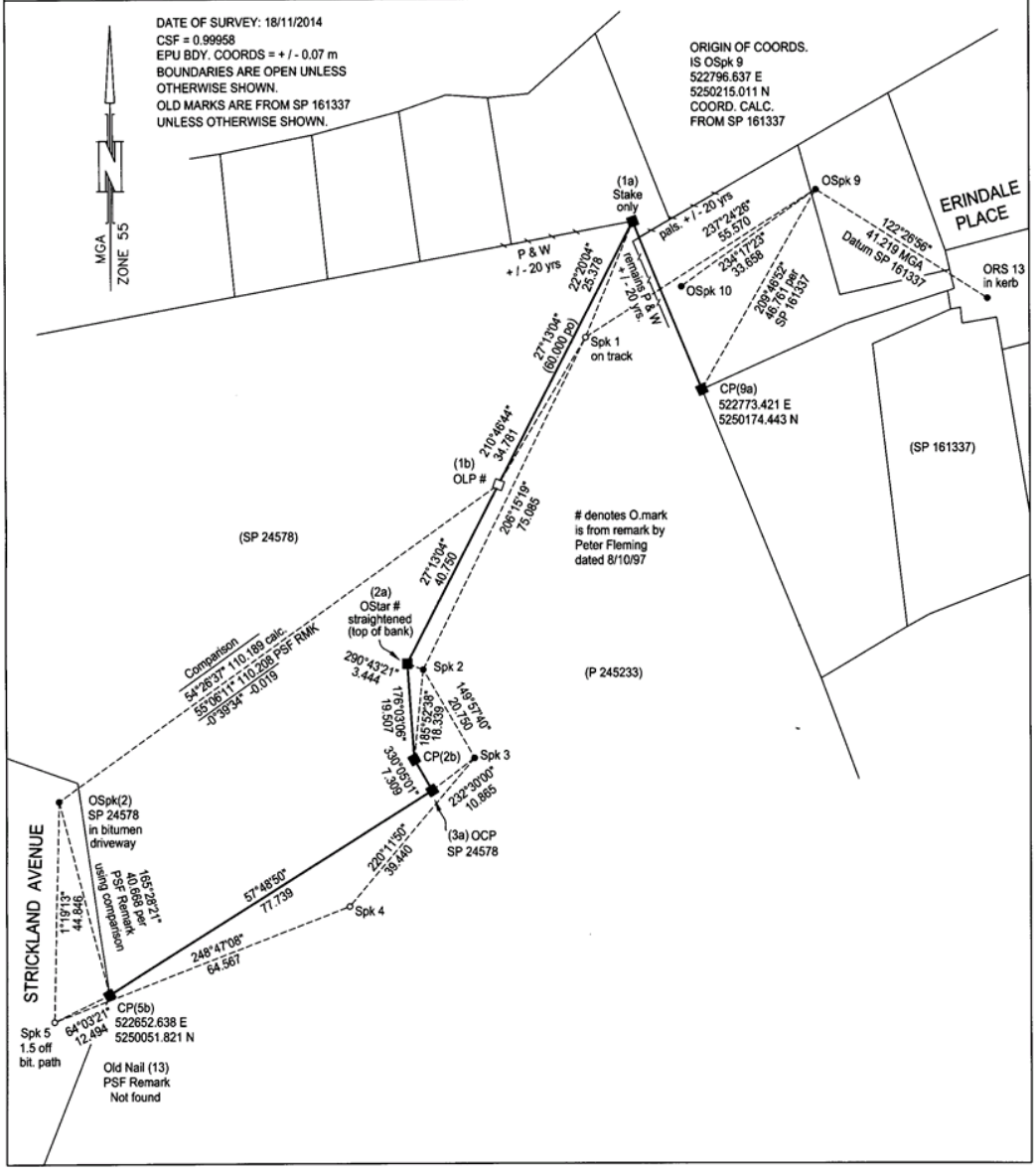
PAGE 1 OF 1 PAGES

SURVEY CERTIFICATE

I, MARK ANDERSON of HOBART
in Tasmania a Registered Land Surveyor HEREBY CERTIFY that:
(a) this survey is based upon the best evidence that the nature of the case admits
(b) the survey notes have been truly compiled from surveys made by me or made under my supervision; and
(c) this survey and accompanying survey notes comply with relevant legislation affecting surveys and are correct for the purpose required.

M. A. Anderson
Signature

Date 11 / 12 / 2014



Application Referral Environmental Development Planner - Response

From:	Rowan Moore Environmental Development Planner 3 January 2019
Recommendation:	Proposal is acceptable subject to conditions.
Date Completed:	
Address:	3 ERINDALE PLACE, SOUTH HOBART 163 STRICKLAND AVENUE, SOUTH HOBART
Proposal:	Dwelling and Associated Vegetation Clearing
Application No:	PLN-18-493
Assessment Officer:	Victoria Maxwell,

Referral Officer comments:

Codes Applicable:

Code	Applicable	Exempt	Permitted	Discretionary
E1.0 Bushfire-Prone Areas	No			
E3.0 Landslide	No			
E9.0 Attenuation	No			
E10.0 Biodiversity	**Yes**	**No**	**No**	**Yes - E10.7.1 P1**
E11.0 Waterway & Coastal	**Yes**	**No**	**No**	**Yes - E11.7.1 P1**
E15.0 Inundation Prone Areas	**Yes**	**No**	**Yes - No applicable standards**	
E16.0 Coastal Erosion	No			
E18.0 Wind & Solar Energy	No			
E20.0 Acid Sulfate Soils	No			

Assessment:

Approval is sought for a single dwelling on a vacant 1847m^2 lot at 3 Erindale Place, South Hobart. Vegetation clearing for a bushfire hazard management area is also proposed for adjacent Council land at 163 Strickland Avenue.

Biodiversity Code

The Code applies because the clearing of native vegetation is proposed within a biodiversity protection area. The adjacent Council land to the west is within a biodiversity protection area and modification of the vegetation on that is land is proposed to establish a bushfire hazard management area. The residential lot is not within a Biodiversity Protection Area.

The submitted documents indicate that twelve trees are proposed to be removed. These include six small *Eucalyptus obliqua* (stringybark) and *Acacia dealbata* (silver wattle) and one large *Eucalyptus obliqua* within the biodiversity protection area. Understorey modification is also proposed for the bushfire hazard management area on the adjacent Council land. Three *Eucalyptus globulous* (blue gum) would be removed from the residential lot.

A natural values assessment was submitted with the application. The main findings of the assessment were:

- The vegetation at 3 Erindale Place is best classified as urban areas (TASVEG code: FUR) because of the high level of disturbance, with some parts marginally classifiable as a wet sclerophyll mapping unit, either '*Eucalyptus globulus* wet forest' (WGL) or '*Eucalyptus obliqua* forest with broad-leaf shrubs' (WOB).

- The adjacent Council-owner land to the west of the title supports wet sclerophyll forest that is transitional between '*Eucalyptus globulus* wet forest' (WGL) or '*Eucalyptus obliqua* forest with broad-leaf shrubs' (WOB), with perhaps a slight favour to WGL over WOB because of a few larger canopy trees of *Eucalyptus globulus*.

- Database information and site assessment did not indicate the presence of any flora or fauna species listed as threatened.

- Database information (and site assessment did not indicate the presence of any fauna species listed as threatened.

- The lot provides potential habitat for a suite of threatened species, however it is not considered significant habitat as it is for ubiquitous and widespread species such as the Tasmanian devil, spotted-tailed quoll, eastern quoll, eastern barred bandicoot, grey goshawk. The absence of hollow-bearing trees precludes the site providing potential nesting habitat for several species (e.g. masked owl, swift parrot). The highly modified understorey and absence of key indicator species precludes the presence of threatened invertebrate species (e.g. chaostola skipper, ammonite snail). The site may be marginally suitable for the Mt Mangana stag beetle (within range) but the absence of large logs (presumably due to fire history and time since last fire) suggests the species is highly unlikely to be present.

- The lot (and adjacent area) does support Eucalyptus globulus (blue gum), which is recognised as a foraging resource for the swift parrot. The contribution made by individual trees, patches and larger areas of blue gums to the overall foraging resource for the swift parrot would vary considerably between years and within seasons.

The report concluded that the impact of the proposed development on biodiversity values would be low and made no recommendations for mitigation measures.

The relevant Code standards are under clause E10.7.1 'Buildings and Works'. The proposal does not comply with acceptable solution A1 because the vegetation community affected ('*Eucalyptus globulous* wet forest') is specified as being a 'moderate' priority biodiversity value in Table E10.1 of the Code. In addition, the submitted natural values assessment classifies the vegetation as being of 'moderate' priority as potential foraging habitat for swift parrots. Despite this, it is important to note that no *E. globulous* would be removed from the land within the Biodiversity Protection Area (the adjacent Council land) with all blue gums proposed for removal being located on the residential lot.

Performance criterion P1 states the following:

Clearance and conversion or disturbance must satisfy the following...

(b) if moderate priority biodiversity values:

(i) development is designed and located to minimise impacts, having regard to constraints such as topography or land hazard and the particular requirements of the development;

(ii) impacts resulting from bushfire hazard management measures are minimised as far as reasonably practicable through siting and fire-resistant design of habitable buildings;

(iii) remaining moderate priority biodiversity values on the site are retained and improved through implementation of current best practice mitigation strategies and ongoing management measures designed to protect the integrity of these values...

The proposed dwelling has been sited in the north-eastern corner of the lot reducing the development's impact upon the native vegetation to the south and west. The dwelling would be constructed to BAL-29 specification reducing the extent of the bushfire hazard management area. The degree of tree clearing is considered reasonable given their proximity to the proposed dwelling.

The remaining vegetation on the Council land is in relatively good condition and will be managed by Council.

Waterway and Coastal Protection Code

The Code applies because development is proposed within a waterway and coastal protection area (vegetation modification for the bushfire hazard management area and a sewer line).

The lot supports a waterway protection area (WPA) for Hobart Rivulet which covers the southern half of the lot, and also a smaller 10m wide WPA for a small drainage channel on the lot. The drainage channel used to convey water from the creek on the adjacent Council land to Hobart Rivulet, but is now redundant as the creek was recently piped through the residential lot.

The relevant standards are under clause E11.7.1 'Buildings and Works'. The proposal does not comply with the acceptable solution.

Performance criterion P1 states the following:

Building and works within a Waterway and Coastal Protection Area must satisfy all of the following:

(a) avoid or mitigate impact on natural values;

(b) mitigate and manage adverse erosion, sedimentation and runoff impacts on natural values;

(c) avoid or mitigate impacts on riparian or littoral vegetation;

(d) maintain natural streambank and streambed condition, (where it exists);

(e) maintain in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation;

(f) avoid significantly impeding natural flow and drainage;

(g) maintain fish passage (where applicable);

(h) avoid landfilling of wetlands;

(i) works are undertaken generally in accordance with 'Wetlands and Waterways Works Manual' (DPIWE, 2003) and "Tasmanian Coastal Works Manual" (DPIPWE, Page and Thorp, 2010), and the unnecessary use of machinery within watercourses or wetlands is avoided.

Several *Eucalyptus globulous* would be removed from within the WPA, however this is required for the dwelling's bushfire hazard management area, being so close to the proposed dwelling. The HMA shown on the submitted BHMP does, however, extend to the southern boundary of the lot which is in excess of what is required under AS3959 (16m). **It is therefore recommended that a condition be applied to any permit granted prohibiting the removal of native vegetation beyond the required 16m HMA (except where required to install the sewer line).**

The drainage channel supports few natural values and carries little flow. No significant impacts on natural values are expected.

Inundation Prone Areas Code

The Code applies because development (bushfire HMA) is proposed on inundation prone land. 1% AEP flood flows from the creek on the adjacent Council land can be expected to pass overland through the middle and southern parts of the the lot.

The relevant standards are under clause E15.7.4 'Riverine Inundation Hazard Areas', however there are no applicable acceptable solitions for the proposed development within the likely flood-prone land. The application is therefore permitted under this Code and the proposal is considered consistent with the Code purpose.

Part 5 Agreement

The owner(s) of this property are subject to a Part 5 Agreement with Hobart City Council (C935042) that requires the owner(s) to:

- Implement the approved Bushfire Management Plan in relation to the land;
- Refrain from removing any tree on the land which has a circumference of more than 400mm measured one metre above the adjacent ground level unless that tree is within three metres of the outer wall of any building on the land that is approved by the Planning Authority or removal of the tree is necessary for safety reasons as determined and approved in writing by the Planning Authority;
- Ensure no habitable building development occurs below the High Terrace Embankment Area on the land; and
- Ensure that any dwelling or fence on the land is constructed in accordance with the guidelines and recommendations of the document *Minimising the Swift Parrot Collision Threat: Guidelines and recommendations for parrot-safe building design*.

The BHMP approved for the subdivision is out of date and can no longer be used to satisfy the *Building Regulations 2016*. An alternative certified BHMP was submitted with the application.

Several trees on the lot with a trunk diameter exceeding 400mm are proposed to be removed. The removal of these is considered necessary to establish an effective bushfire hazard management area as they are close, or within, the proposed building footprint.

The proposed building would be above the high terrace embankment.

The proposed dwelling design is largely consistent with the swift parrot collision guidelines, however a glass balustrade is proposed for the upper level deck.

Commentary regarding bird-strike risk was included in the submitted natural values report. The report states the following:

The elevation-by-elevation and window-by-window analysis of the risk of window-strike by birds (particularly the swift parrot) has demonstrated a generally low risk, and only minor mitigation is recommended (i.e. low reflectance glass on some windows only).

Advice is recommended for any permit granted recommending the use of low-reflectivity glazing and substituting or treating any clear glass balustrades to ensure compliance with the Agreement.

Recommended Conditions:

No native vegetation may be removed from 3 Erindale Place more than 16m from the southern edge of the dwelling, unless required for the installation of the sewer line.

Reason for condition

To ensure the use/development does not result in unnecessary or unacceptable loss of priority biodiversity values

All construction vehicles and machinery must be effectively cleaned of soil before entering the property.

Soil cleaned from construction vehicles and machinery must not be allowed, either directly or indirectly, to enter waterways or the Council's stomwater system.

Note: further information on effective measures for washdown can be found here.

Reason for condition

To minimise the spread of weeds and pathogens

Sediment and erosion control measures, in accordance with an approved soil and water management plan (SWMP), must be installed prior to the commencement of work and maintained until such time as all disturbed areas have been stabilised and/or restored or sealed to the Council's satisfaction.

A SWMP must be submitted prior to the issue of any approval under the *Building Act 2016* or the commencement of work, whichever occurs first. The SWMP must be prepared in accordance with the *Soil and Water Management on Building and Construction Sites* fact sheets (Derwent Estuary Program, 2008), available here.

Particular attention must be given to managing erosion and sedimentation risk when establishing the bushfire hazard management area on the adjacent Council land.

All work required by this condition must be undertaken in accordance with the approved SWMP.

Advice: Once the SWMP has been approved, the Council will issue a condition

endorsement (see general advice on how to obtain condition endorsement).

Where building approval is also required, it is recommended that documentation for condition endorsement be submitted well before submitting documentation for building approval. Failure to address condition endorsement requirements prior to submitting for building approval may result in unexpected delays.

Reason for Condition

To avoid the pollution and sedimentation of roads, drains and natural watercourses that could be caused by erosion and runoff from the development.

Recommended Advice:

Please note that the owner(s) of this property are subject to a Part 5 Agreement with Hobart City Council (C935042) that requires the owner(s) to:

- Implement the approved Bushfire Management Plan in relation to the land (superseded);
- Refrain from removing any tree on the land which has a circumference of more than 400mm measured one metre above the adjacent ground level unless that tree is within three metres of the outer wall of any building on the land that is approved by the Planning Authority or removal of the tree is necessary for safety reasons as determined and approved in writing by the Planning Authority (trees proposed to be removed on plans approved);
- Ensure no habitable building development occurs below the High Terrace Embankment Area on the land (proposal complies); and
- Ensure that any dwelling or fence on the land is constructed in accordance with the guidelines and recommendations of the document Minimising the Swift Parrot Collision Threat: Guidelines and recommendations for parrot-safe building design.

With regard to compliance with the swift parrot collision guidelines, it is recommended that the following occurs to avoid breaching the Agreement:

- low-reflectivity glass (<10% visible light reflectivity) is used wherever possible; and
- the clear glass balustrades are treated in accordance with the guidelines (frosted, tinted, patterned etc) or substituted with an alternative balustrade design (e.g. tension wire).

Copies of the Part 5 Agreement are available from The LIST website (www.thelist.tas.gov.au) via the 'Scanned Dealings' section.

8. REPORTS

8.1 Sullivans Cove Planning Scheme 1997 - Macquarie Point Site Development Plan - Proposed Amendments File Ref: F17/56953; 32-3-93

Report of the Manager Planning Policy and Heritage and the Director City Planning of 9 January 2019 and attachments.

Delegation: Council

REPORT TITLE: **SULLIVANS COVE PLANNING SCHEME 1997 - MACQUARIE POINT SITE DEVELOPMENT PLAN - PROPOSED AMENDMENTS**

REPORT PROVIDED BY: Manager Planning Policy and Heritage
Director City Planning

1. Report Purpose and Community Benefit

1.1. This report considers a notice (Attachment A) to Council as the planning authority, from the Board of the Macquarie Point Development Corporation (MPDC), under section 39G(3) of the *Macquarie Point Development Corporation Act 2012* (MPDC Act).

1.2. The notice specifies that the Board intends to request, under s39G(1) of the MPDC Act, the Minister for State Growth to amend the *Sullivans Cove Planning Scheme 1997* (SCPS). The proposed amendments relate to various clauses in the Macquarie Point Site Development Plan (SDP) and the parking policy objectives in Section 26.3.

1.3. Council has 21 days from the date of the notice (2 Jan 2019) to make a representation in relation to the intended request.

1.4. A copy of the draft amendments and supporting planning report is provided in Attachments B and C.

1.5. The proposal benefits the community by ensuring that redevelopment of the site is undertaken in a manner consistent with the strategic objectives of the SCPS1997 and the *Macquarie Point Development Corporation Act 2012*.

2. Report Summary

2.1. The Tasmanian Government considers that Macquarie Point presents a once in a generation opportunity for Hobart and Tasmania and in 2016 directed the MPDC to reset the vision for the Macquarie Point site and prepare a new plan for development based on the MONA vision.

2.2. Under the new vision the area is to be developed to include public space, exhibition space, commercial space, cultural space, conference facilities, accommodation and facilities to support Hobart's role as Australia's Antarctic gateway and tourism infrastructure.

2.3. The proposed amendments to implement the reset vision include changes to the Desired Future Character Statements (32.3), height and siting plan (Figures 32.3 and 32.4), development standards (32.7.3 to 32.7.7) and general considerations (32.4) to implement the height, siting and design concepts from the reset masterplan.

2.4. The MPDC has submitted that the following concepts are embodied in the proposed amendments and are considered to be highly consistent with the Objectives for Urban Form under Section 23.2 of the SCPS1997:

2.4.1. The bulk, height and siting of buildings are to be sympathetic to the natural topography of the headland, escarpment surrounding the Cenotaph and reinforce the natural shoreline;

2.4.2. Maintain important views as identified on Figure 32.4 of the SDP;

2.4.3. Enrich the meaning and memory of the changing nature of Macquarie Point over time through expression of the use and development layers from the past including the topography, natural shoreline, Round House, Goods Shed and Royal Engineers Building;

2.4.4. Develop a network of connections through and around the site including a series of primary shared street spaces extending north from Evans Street towards the centre of the site; and smaller and more intimate secondary spaces. Their position can be adjusted to suit specific development as it unfolds;

2.4.5. Reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site;

2.4.6. Built form is to be ‘set in the round’ on the ‘cove floor’;

2.4.7. Buildings are to incorporate articulated roof forms to provide interest when viewed from elevated surrounding areas of the Cenotaph and Domain.

2.5. It is considered that the proposed amendments to the Macquarie Point SDP in the SCPS are an appropriate response to the Tasmanian Governments revised vision for the future use and development of the site.

2.6. It is recommended that the proposed amendments be supported as they are consistent with; the strategic principles of the SCPS1997, the Southern Tasmania Regional Land Use Strategy, relevant State Policies and further the objectives of LUPAA.

2.7. An additional amendment incorporating a use standard for visitor accommodation is also recommended consistent with the approach taken in Planning Directive No 6 – Exemption and Standards for Visitor Accommodation in Planning Schemes.

3. Recommendation

That:

1. Pursuant to section 39G(4) of the Macquarie Point Development Corporation Act 2012, Council advise the Board of the Macquarie Point Development Corporation that it supports the proposed request to the Minister for State Growth and the draft amendments to the Sullivans Cove Planning Scheme 1997 as shown in Attachment B.

2. Council recommend to the Board that an additional amendment be included which applies standard A2/P2 in Planning Directive No 6 – Exemption and Standards for Visitor Accommodation in Planning Schemes to visitor accommodation use.

3. Council delegate to the General Manager the authority to give notice to the Minister under section 39H(4) of the MPDC Act that Council intends to seek representations from the public in relation to the proposed amendments.

4. Background

4.1. In 2012, the State Government established the Macquarie Point Development Corporation (MPDC) and gave it responsibility for the remediation and redevelopment of most of the land within Activity Area 3.

4.2. Under the *Macquarie Point Development Corporation Act 2012,* the MPDC is required to plan, facilitate and manage the redevelopment of the site.

4.3. At its meeting of 12 October 2015, Council initiated amendments to the SCPS which inserted the Macquarie Point SDP, along with other associated amendments to the planning scheme document in order to facilitate implementation of the *Macquarie Point Strategic Framework and Masterplan 2015-2030*.

4.4. Following a public exhibition and lengthy hearing process, the Tasmanian Planning Commission gave final approval to a modified version of the amendments in November 2016.

4.5. In response to an invitation from the State Government, in December 2016, Mona put forward its vision for the Macquarie Point site focusing on the development of an arts and cultural precinct and a nationally significant Truth and Reconciliation Art Park.

4.6. In response to public feedback and recognising that Macquarie Point presents a once in a generation opportunity for Hobart and Tasmania, the State Government directed the MPDC to reset the vision for the Macquarie Point site and prepare a new plan for development based on the Mona vision. The reset masterplan focuses solely on the first stage of the Mona vision and is confined to the bounds of the existing Site Development Plan in the SCPS1997.

4.7. Under the new vision the area is to be developed to include public space, exhibition space, commercial space, cultural space, conference facilities, accommodation and facilities to support Hobart's role as Australia's Antarctic gateway and tourism infrastructure.

Macquarie Point Development Corporation Amendment Act 2018

4.8. On 17 December 2018, the Parliament of Tasmania passed the *Macquarie Point Development Corporation Amendment Act 2018*. The intention of this Act was to provide a framework to accelerate investment in, and development of, the Macquarie Point site to reflect a shift in focus from remediation to redevelopment.

4.9. The Amendment Act also introduced a new process for the Minister for State Growth to amend the SCPS. This process is outlined in the flow chart provided in Attachment D. The relevant MPDC Act provisions are provided in Attachment E.

4.10. The process requires the Board of the MPDC to give notice to Council and invite representations within 21 days prior to submitting a request for a planning scheme amendment to the Minister for State Growth. If the Minister agrees to prepare an amendment the Minister must give notice to Council.

4.11. Council then has 14 days to give notice to the Minister if it:

4.11.1. Intends to undertaken public consultation;

4.11.2. Does not intend to undertake public consultation; or

4.11.3. Does not support the proposed amendments.

4.12. If Council elects not to undertake public consultation it may make representations to the Minister on the planning scheme amendments within 28 days.

Existing situation

4.13. The Macquarie Point site is approximately 9.3 hectares in area and lies predominantly on the reclaimed cove floor adjacent to the working port, along the Derwent River at the eastern edge of the city.

4.14. At present the site is largely vacant open space, occupied by a small office building, microbrewery and a number of sheds. The site has also been used for other community events including Dark Mofo since 2015 and a range of public events and performances in the Goods Shed.

4.15. Land in the surrounding area is primarily used for recreation, public access, the Cenotaph, commercial and professional services, retailing, port facilities, light industry, marine industry, fishing industry, waste water treatment and educational purposes.

4.16. Remediation of the contaminated parts of the site have commenced and will be ongoing for some time in accordance with the site remediation strategy.

Existing Planning Scheme Provisions

4.17. The site incorporates the Former Railyards and Boral concrete batching plant 'Key Sites' under Part F of the Planning Scheme. The Key Site status means that the Planning Authority has identified the site as having the potential to be used or developed to achieve a range of strategic planning objectives.

4.18. The site is contained within Activity Area 3.0 which also matches the extent of the Macquarie Point Site Development Plan. The provisions for the SDP are set out under Section 32 of the Planning Scheme and are intended to facilitate the identified preferred future through promotion of appropriate use and development and to implement the *Macquarie Point Strategic Framework and Masterplan 2015-2030*.

4.19. The key elements of the SDP are as follows:

4.19.1. Desired future character statements (32.3);

4.19.2. Matters to be considered when assessing applications (32.4);

4.19.3. Use tables setting out exempt, permitted, discretionary and prohibited uses in use areas 1, 2 and 3 (32.5);

4.19.4. Use standards related to providing a mix of uses, residential amenity and car parking provision (32.6);

4.19.5. Development standards related to port impacts, building form, alignment, design, outdoor storage, inundation and pedestrian links (32.7);

4.19.6. Subdivision (32.8); and

4.19.7. Environmental management related to site remediation and attenuation distance from the Macquarie Point waste water treatment plant (32.14).

Macquarie Point Reset Masterplan

4.20. The Tasmanian Government considers that Macquarie Point presents a once in a generation opportunity for Hobart and Tasmania and directed the MPDC to reset the vision for the Macquarie Point site and prepare a new plan for development based on the MONA vision.

4.21. The reset masterplan follows a direction from the Minister to the Board of the Corporation under Section 36(2) of the MPDC Act to amend the *Macquarie Point Strategic Framework and Masterplan 2015-2030* (former masterplan). The reset masterplan is an amended site redevelopment plan under Section 37(6) and took effect when approved by the Minister under Section 37(7) of the MPDC Act.

4.22. The reset masterplan represents the urban design rationale which ground-truths the Mona Vision and aligns with the strategic policies of the SCPS.

4.23. It outlines the key concepts and proposed uses as well as importantly allowing for a built form which respects, recognises and acknowledges the landscape in which it sits.

4.24. The reset masterplan envisages a connected and active place at ground level and the mixed-use nature of the site is demonstrated by the flexibility offered in the use area plan.

4.25. Arts and institutional uses are proposed adjacent to the boundary shared with the Hobart port reflecting the need to provide a buffer zone of non-sensitive uses.

4.26. The siting of these uses also makes provision for the possible requirement for some limited direct access into the port area particularly from the Antarctic and Science precinct. The remainder of the site presents opportunities for mixed-use development.

4.27. Unlike the former masterplan, the reset masterplan does not designate building lots, rather it offers larger parcels with the flexibility to respond to the nature and scale of the specific development and market demand providing the strategic principles which underpin the Planning Scheme are furthered.

4.28. As with the former masterplan, car parking will be kept to the periphery of the site as much as possible to emphasise the prioritisation of pedestrians under the site's mobility network.

4.29. The ultimate arrangement of uses over the life of the development will be informed by the Corporation's land release strategy and discussions with potential developers.

4.30. A detailed assessment of the reset masterplan is contained in section 4 of the MPDC Planning Report provided in Attachment C.

5. Proposal and Implementation

5.1. Council may make a representation to the Board of the MPDC by 23 January 2019 in relation to the proposed request to the Minister and the draft amendments. The representation may include a statement that Council:

5.1.1. Does not support the proposed request or draft amendments; and;

5.1.2. A statement of the amendments that would need to be made to the request and the draft planning scheme amendments in order for Council to support them.

5.2. In relation to the proposed request to the Minister to prepare planning scheme amendments to facilitate implementation of Stage 1 of the Mona vision, it is considered that the request is appropriate as such a request is facilitated by recent amendments to the MPDC Act passed by the Parliament of Tasmania.

5.3. In relation to the draft planning scheme amendments it is considered that support is merited as the planning assessment provided by the MPDC demonstrates that the amendments:

5.3.1. Further the requirements of the objectives set out in Schedule 1 to the *Land Use Planning and Approvals Act 1993* (LUPAA);

5.3.2. Are consistent with applicable State Policies;

5.3.3. As far as practicable are consistent with the Southern Tasmania Regional Land Use Strategy; and

5.3.4. Are consistent with the Sullivans Cove Strategic Framework under Part B of the SCPS.

5.4. Prior to submission, the MPDC consulted with Council officers in relation to the technical merits and drafting of the proposed amendments. The issues raised during that consultation process have generally been addressed in the final draft of the amendments.

5.5. The rationale for and merits of the proposed amendments are outlined and discussed below.

Draft Planning Scheme Amendments

5.6. The principal amendments are as follows:

5.6.1. Amend Clause 32.1.1 of the SDP to change the reference from the former master plan to the reset masterplan.

5.6.2. Insert a new clause 32.2.6 that allows consideration of interim or temporary use and development for a period up to 5 years providing buildings are located and designed in a manner that does not prejudice the future development of the area or appropriate pedestrian, cycle and vehicle linkages through the site to adjacent Activity Areas.

5.6.3. Amend the Desired Future Character Statement under 32.3.4 to reflect the removal of a physical building envelope from the reset masterplan layout. The site of the former Round House is now to be acknowledged as a landscape element.

5.6.4. The key public space located close to the intersection of the Brooker and Tasman Highways and Davey and Evans Streets will now form the landmark entry to the site for those approaching from the CBD.

5.6.5. Amend the Desired Future Character Statement in clause 32.3.7 to ensure that buildings on the Cove Floor are to be freestanding, built in the round as opposed to the regular street grid of buildings on natural ground.

5.6.6. Amend the view lines under the Desired Future Character Statement at clause 32.3.8 including to:

5.6.6.1. Replace the reference to the Water to Water Promenade with the view aligning NE/SW from Sullivans Cove to the Derwent River;

5.6.6.2. Insert a new reference to the important view to Kangaroo Bay; and

5.6.6.3. Insert a new reference to the view along key public space and from the Cove Floor to the Cenotaph.

5.6.7. Amend the Desired Future Character Statement in clause 32.3.9 to remove the reference to the industrial saw tooth roof form and insert a new example for rooftop gardens. The reset masterplan moves away from the industrial/ saw tooth form focus of the former masterplan.

5.6.8. Amend the Desired Future Character Statement in Clause 32.3.11 to respond to the updated spatial network of the reset masterplan and associated replacement Figure 32.3.

5.6.9. Insert a new Desired Future Character Statement at Clause 32.3.12 noting the requirement for a direct pedestrian link between the Key Public Space and Cenotaph that traverses the escarpment. It is expected that this will most likely require installation of a lift or similar for accessibility.

5.6.10. Insert a new Desired Future Character Statement at Clause 32.3.13 to reflect the intended gateway building at the western entry of the site in the vicinity of the Concert Hall and intersection of Davey and Evans Street.

5.6.11. Insert a new Desired Future Character Statement at Clause 32.3.14 to ensure that developments for noise sensitive uses are adequately designed and constructed to protect residential amenity and reduce the potential for land use conflict that may compromise the use of Macquarie Point as a major public event space.

5.6.12. Insert a new matter for consideration under Clause 32.4 requiring consideration of the impact of proposed use and development on the viability of Macquarie Point as a major public event space.

5.6.13. Amend the Use Tables in Clause 32.5 to better reflect the intended uses under the reset masterplan and amend the related use areas in Figure 32.1.

5.6.14. Amend the deemed to comply standard under A1 of Clause 32.6.1 to reflect updated gross floor areas associated with the uses of the reset masterplan. The reset masterplan has a reduced focus for residential development now including a 15,000m2 maximum Gross Floor Area within Use Areas 2.1 and 2.2 shown on Figure 32.1 down from 50,000m2. This limit reflects the shift under the reset masterplan to a more civic focus for the site and to ensure that uses contribute to the interest and activity of the area.

5.6.15. Amend clause 32.6.2 to apply more generally to Residential and Visitor Accommodation Uses throughout the site in order to protect residential amenity and reduce the potential for land use conflict with the working port and the use of the site as a major public event space.

5.6.16. Amend A2 of clause 32.7.2 to remove the reference to the Round House and remove the reference to specific roof forms and instead include a floor area threshold of 300m^2, above which the treatment of roofs will be discretionary.

5.6.17. Amends P1 of clause 32.7.2 to ensure that buildings sited adjacent to the headland do not protrude above the escarpment when viewed from the Cenotaph.

5.6.18. Amend A3 of clause 32.7.2 to ensure that buildings are built within the areas on Figure 32.3 but don’t necessarily need to match the shape of the envelopes.

5.6.19. Amend clause 32.7.3 to provide flexibility for buildings to be sited within larger building areas with a focus on forming the spaces but not necessarily occupying the entire width of the longer street frontages of these building areas. The Performance Criteria provide for a variation in building shapes provided that the overall impression is of retention of continuous alignment of space.

5.6.20. Amend clause 32.7.5 to reflect the updated layout and urban design rationale of the reset masterplan. This clause currently manages the siting of buildings within the open space area between the northern edge of buildings shown on the Development Framework Figure 32.3 and the foot of the escarpment. This clause is now amended to apply to buildings along the foot of the escarpment within Use Area 2 on Figure 32.1.

5.6.21. Amend the Objective and P1 of clause 32.7.6 to replace the term ‘interaction’ with ‘interest’ in response to a recognition that the civic nature of some buildings mean that it may not be practical in all cases to provide windows in the frontage of a building.

5.6.22. Amend the attenuation standard from the waste water treatment plant clause 32.14.6 to insert a new P1 for consideration of sensitive uses within the 400m and delete A2 and P2 dealing with non- sensitive uses. These changes are consistent with the approach under the Attenuation Code of the State Planning Provisions.

5.6.23. Update Figures; 32.1 Use Areas, 32.2 View and Sightlines, 32.3 Development Framework and 32.4 Building Envelopes and Heights to reflect the reset masterplan.

Discussion

5.7. The proposed amendments include changes to the Desired Future Character Statements (32.3), height and siting plan (Figure 32.3 and 32.4), development standards (32.7.3 to 32.7.7) and general considerations (32.4) to implement the height, siting and design concepts from the reset masterplan.

5.8. The MPDC has submitted that the following concepts are embodied in the proposed amendments and are considered to be highly consistent with the Objectives for Urban Form under Section 23.2 of the SCPS:

5.8.1. The bulk, height and siting of buildings are to be sympathetic to the natural topography of the headland, escarpment surrounding the Cenotaph and reinforce the natural shoreline;

5.8.2. Maintain important views as identified on Figure 32.4 of the SDP;

5.8.3. Enrich the meaning and memory of the changing nature of Macquarie Point over time through expression of the use and development layers from the past including the topography, natural shoreline, Round House, Goods Shed and Royal Engineers Building;

5.8.4. Develop a network of connections through and around the site including a series of primary shared street spaces extending north from Evans Street towards the centre of the site; and smaller and more intimate secondary spaces. Their position can be adjusted to suit specific development as it unfolds;

5.8.5. Reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site;

5.8.6. Built form is to be 'set in the round' on the 'cove floor';

5.8.7. Buildings are to incorporate articulated roof forms to provide interest when viewed from elevated surrounding areas of the Cenotaph and Domain.

5.9. The key issues related to the implementation of the reset masterplan are outlined below:

Building envelope and view lines

5.10. The former masterplan identified and modelled specific building envelopes that translated to Figure 32.4 of the SDP. The proposed updates to that Figure reflect an overlay of the use areas of the reset masterplan with the heights of the former masterplan. Where the 2017 use areas extended over more than one 2015 building envelope, the lowest of the 2015 building envelope heights has been taken to be the permitted height for the proposed replacement Figure 32.4.

5.11. Applying the lowest of the 2015 building heights as the permitted height for the 2017 use areas ensures that 2017 Planning Scheme amendments go further in ensuring that the important views and sightlines are not unreasonably impacted.

5.12. The assessment by Leigh Woolley (Urban Design Consultant) demonstrates that the proposed permitted envelopes under the replacement Figure 32.4 will significantly reduce the impact on those envelopes as viewed from the previously established important viewing points including from the Cenotaph and within the Cove.

Traffic, access and parking

5.13. Under the reset masterplan, development will continue to have strong pedestrian and cycling links within the site itself and to reconnect with its surrounds including the Hobart waterfront and CBD, Intercity Cycleway and Queens Domain. The street network will minimise vehicular access to heart of the site. To ensure that future transport networks can be incorporated within the site, corridors for the movement of light rail and heavy vehicles will be reserved where they traverse the site.

5.14. Movement of vehicles will be focused on Evans Street, and the access from the Tasman Highway to the Escarpment area. Access to particular development sites and car parking areas will be off Evans Street or the Escarpment car park access. Whilst the internal street network has not been precisely defined, it is not expected that there would be connectivity through the site, for instance between the Escarpment and Evans Street.

5.15. The pedestrian movement network comprises various corridors crossing the site, in addition to the vehicular corridors described above which would also provide for pedestrian movement. There will be two primary pedestrian corridors, meeting at right angles in the centre of the site. One corridor is essentially an extension of the Brooker Avenue alignment. The other primary corridor is a continuation of Franklin Wharf, connecting Hunter Street with the site through the University of Tasmania / IXL buildings between Hunter Street and Evans Street.

5.16. Access for cyclists would utilise a combination of the vehicular network and the pedestrian network, providing a high degree of accessibility through the site.

5.17. The reset masterplan maintains the proposal for a maximum of 350 off-street parking spaces on the Macquarie Point site, with an additional 350 spaces in the escarpment car park area.

5.18. The Traffic Impact Assessment (GHD) indicates that the volume of peak period traffic activity associated with the reset masterplan is generally less than assumed in the previous (2015) assessment. An increase of some 50 vehicles per hour is expected in the PM peak, departing the site via Evans Street. However in the context of the overall volume of traffic activity from Macquarie Point, and already on the network in the vicinity, this increase is relatively minor.

Market Impacts

5.19. The market impacts of the reset masterplan have been assessed by the AEC Group. The former masterplan took a more prescriptive approach to allocating floor space across uses, whereas the new reset masterplan designates maximum floor space caps to various uses - enabling flexible delivery of the development over a 15 year+ horizon.

5.20. Principally, the difference in quantum of floor space envisaged in the reset masterplan compared with the former masterplan is a substantial increase in floor space for education and research uses (from 13,600m^2 to a potential maximum of 50,000m^2 GFA). Other differences include:

5.20.1. The maximum floor area limit for Residential uses has been reduced from 43,949m^2 to 15,000m^2.

5.20.2. Commercial floor space is reduced to a maximum of 30,000m^2 from circa 54,500m^2.

5.20.3. Hotel uses are increased slightly, from around 16,000m^2 to a maximum of 20,000m^2.

5.20.4. Retail uses remain broadly unchanged, previously circa 9,400m2 to 10,000m^2.

5.21. The overall conclusion is that the floor space allocated to the different uses will have negligible impact on existing markets or the retail function of the Hobart CBD.

Infrastructure

5.22. The updated Infrastructure Assessment prepared by Pitt & Sherry confirms that, in broad terms, there is sufficient capacity within existing power, communication, sewer, water and gas networks to service development in accordance with the reset masterplan with only limited off site works and payment of standard authority charges.

5.23. As with the former Masterplan, the specifics of the stormwater system have not been fully resolved at this stage however, it is expected that any new development would be able to discharge readily to the river given its proximity should the existing connections not be acceptable.

Waste water treatment plant impacts

5.24. The requirements under clause 32.14.6 of the SCPS mandate that twenty uses cannot be sited within 400 m of the Macquarie Point wastewater treatment plant (WWTP) whilst it is still operating, unless a site-specific report is provided that satisfies P2 of clause 32.14.6.

5.25. Amendments are proposed to clause 32.14.6 in line with the State Planning Provisions for sensitive uses within a distance of 400 m from the boundary of the WWTP. The existing Clause 32.14.6 flowed from evidence provided to the TPC during hearings on the SDP amendments to the SCPS in 2016. At that time, all evidence was on a ‘desktop basis’.

5.26. The more recent odour audit and modelling report prepared by Environmental Dynamics brings new odour and noise modelling evidence informed by on site odour and noise sampling. The 2017 odour audit and sampling has found the main odour sources are the emissions from the tanker unloading, and fugitive odours from the nearby inlet works area. The consultants have concluded that if these odour sources are mitigated, then the remaining odour sources are such that a reduction of the 400m attenuation distance to a 200m attenuation distance is appropriate even without further odour mitigation.

5.27. On the 18 September 2018, TasWater and the Government announced that the WWTP would be decommissioned and removed within 4 years. Environmental Dynamics report supports the discretionary use status for consideration of sensitive uses over the intervening period.

Heritage

5.28. As outlined in the report by Austral Tasmania, the site has been subject to a number of previous heritage investigations which are relevant to the proposed Planning Scheme amendments.

5.29. The SDP area currently contains only the Royal Engineers Building, Goods Shed and the Red Shed as places of cultural significance in Table 1 and Figure 5 of Schedule 1.

5.30. The proposed amendments do not effect these listings and future 'building or works' to these places would therefore continue to be subject to the provisions of clause 22.4 of the Planning Scheme.

5.31. The site includes two places of archaeological sensitivity identified in Table 2 and Figure 5a of Schedule 1. These two places are the:

5.31.1. 'Royal Engineers Headquarters and Kings Yard' (Ref. No. 12); and

5.31.2. 'Hobart Rivulet - Domain Diversion Tunnel' (Ref. No. 90).

5.32. Other parts of the site are not identified in the Planning Scheme as places of archaeological sensitivity, although the general provision of clause 22.6.1 relating to excavation within the planning area may be applicable.

5.33. Aboriginal heritage investigations have been undertaken of the site and no sites of significance have been identified.

Visitor Accommodation

5.34. Visitor Accommodation is a permitted use in Use Area 2 – Mixed Use in the current SDP and in the proposed amendments. It is considered that the opportunity should be taken in these amendments to address the potential conflicts between long term residential use and short term visitor accommodation.

5.35. This is consistent with the approach taken in Planning Directive No 6 (PD6) – Exemption and Standards for Visitor Accommodation in Planning Schemes. The PD6 provisions have the effect of making visitor accommodation in Sullivans Cove Activity Area 2: Mixed Use permitted only where the application relates to all dwellings in a strata complex or relates to an individual dwelling with separate ground level pedestrian access to a road. Otherwise visitor accommodation in strata complexes is prohibited.

5.36. Given that new residential buildings in Macquarie Point are likely to be designed for specific residential uses and or visitor accommodation, the prohibition that applies in Activity Area 2 may not be necessary. It should be sufficient to apply the PD6 discretionary standard A2/P2 as shown below:

A2 Visitor Accommodation is not for a lot, as defined in the *Strata Titles Act 1998,* that is part of a strata scheme where another lot within that strata scheme is used for a residential use.	**P2** Visitor Accommodation within a strata scheme must not cause an unreasonable loss of residential amenity to long term residents occupying other lots within the strata scheme, having regard to: (a) the privacy of residents; (b) any likely increase in noise; (c) the residential function of the strata scheme; (d) the location and layout of the lots; (e) the extent and nature of any other non-residential uses; and (f) any impact on shared access and common property.

Contaminated Land

5.37. A site Remediation Strategy Overview by AECOM provides an update as of 2017.

5.38. Management of land contamination on the site is currently addressed in Section 32.14 Environmental Management and no amendments are proposed to these provisions.

5.39. The MPDC Act 2012 and the contaminated land provisions under Section 32.14 of the SDP enable an accredited Environmental Auditor to be appointed to certify that parts of the Site are suitable for the proposed purposes.

5.40. The Corporation has engaged an independent Site Environmental Auditor to provide confidence to key stakeholders that environmental investigations and remedial activities have been completed to a level compliant with required standards.

Climate change

5.41. The Tasmanian Government commissioned GHD to prepare a climate change impact assessment in July 2012. The purpose of the assessment was to review the effect of storm surges and sea level rise on the proposed development of the Macquarie Point site.

5.42. The analysis indicated that:

5.42.1. 1 in 100 year Inundation Level due to sea level rise and storm surge for the site is 2.3m above Australian Height Datum (AHD); and

5.42.2. A 0.5m freeboard will be required for habitable floors (i.e. 2.8 AHD minimum level).

5.43. The Development Standard for Inundation Hazard under Clause 32.7.9 of the SDP will remain and ensure that the finished floor level of a habitable room is no less than 2.8m above AHD.

Land Use Conflict

5.44. The proposal as far as practicable avoids the potential for land use conflicts with use and development permissible in the surrounding area. The three pertinent issues are the interface with the working port, the potential for environmental harm to surrounding uses from the WWTP and the potential for land use conflict between residential and visitor accommodation uses and the use of Macquarie Point for major public events.

5.45. The proposed amendments maintain the provisions of the SCPS that manage the port interface and ensure that future use and development does not compromise the operation of the Port of Hobart. To protect the operations of the port the non-sensitive use buffer of the Arts and Institutional Activity Area (existing Commercial and Institutional Area) will be maintained and Desired Future Character Statements are included in the SDP at clause 32.3.5, along with standards at clauses 32.6.2 and 32.7.1 for both sensitive and non-sensitive uses in specific areas along, or in close proximity to, the port boundary.

5.46. Subject to Environmental Dynamics report, the proposed amendments to Clause 32.14.6 will as far as practicable, avoid the potential for land use conflicts between the WWTP, while it continues to operate, and the use and development permissible under the Planning Scheme.

5.47. The proposed amendments includes a new matter for consideration under Clause 32.4 and amendments to Clause 32.6.2 requiring residential and visitor accommodation development to be designed and constructed to achieve a minimum reduction in sound pressure level between the exterior of the building and the bedroom or living room. The design targets in 32.6.2 have been drafted with reference to similar provisions for an entertainment zone in the Fortitude Valley Neighbourhood Plan, Brisbane City Council, 2000.

Southern Tasmania Regional Land Use Strategy

5.48. The MPDC assessment (section 7.5 of the supporting Planning Report) of the proposed amendments in relation to the STRLUS is supported. The proposed amendments are consistent with the following strategies in the STRLUS:

5.48.1. The STRLUS recognises the strategic economic importance of the site in policies SEO 1.1 & SEO 1.2. The proposed amendments are consistent with these policies in that it provides place specific planning scheme provisions that are based upon a masterplan designed to capitalise upon the strategic advantages of the site: being its location in proximity to Hobart CBD and Sullivans Cove.

5.48.2. The proposed amendments also provide for mixed use development within the Primary Activity Centre (being defined as Hobart CBD and immediate surrounds including the waterfront) consistent with the Activity Centres policies under the STRLUS. The amendment does not undermine the primacy of the Hobart CBD in the Activity Centre Hierarchy.

Objectives of the Land Use Planning and Approvals Act 1993

5.49. The Minister must be satisfied that the proposed amendments further the Objectives set out in Schedule 1 of the Land Use Planning and Approvals Act 1993. The MPDC assessment in section 7.5 of the supporting Planning Report in relation to these objectives is supported.

Conclusion

5.50. It is considered that the proposed amendments to the Macquarie Point SDP in the SCPS are an appropriate response to the Tasmanian Governments revised vision for the future use and development of the site.

5.51. It is recommended that the proposed amendments be supported as they are consistent with; the strategic principles of the SCPS1997, the Southern Tasmania Regional Land Use Strategy, relevant State Policies and further the objectives of LUPAA.

6. Strategic Planning and Policy Considerations

6.1. The proposed planning scheme amendments will assist in the achievement of the strategic objectives of the Capital City Strategic Plan 2015-2025 particularly in relation to Goal 1 Economic Development, Vibrancy and Culture and Goal 2 Urban Management - 2.3 "City and regional planning ensures quality design, meets community needs...."

7. Financial Implications

7.1. Funding Source and Impact on Current Year Operating Result

7.1.1. The planning scheme amendments themselves do not have any financial implications.

7.2. Impact on Future Years' Financial Result

7.2.1. The planning scheme amendments themselves do not have any financial implications. Future development of the site and implementation of the reset vision may have implications in future financial years.

7.3. Asset Related Implications

7.3.1. None.

8. Legal, Risk and Legislative Considerations

8.1. The proposed amendments to the Macquarie Point SDP in the SCPS are being dealt with under Division 3 of the *Macquarie Point Development Corporation Act 2012*.

8.2. This report considers a notice to Council as the planning authority, from the Board of the MPDC, under section 39G(3) of the MPDC Act. Council has until the 23 January 2019 to make a representation in relation to the intended request for a planning scheme amendment.

9. Community and Stakeholder Engagement

9.1. The MPDC has engaged with close to 20 consultative groups including over 300 stakeholders at each stage of the vision reset process to provide opportunities for input. The MPDC has consulted with the Aboriginal community on the concept of the reset vision, with particular focus on the Truth and Reconciliation Art Park.

9.2. A series of further stakeholder briefings will be conducted by the MPDC across key business, tourism, arts and culture, political and Antarctic groups. The purpose of these briefings is to inform the stakeholders about the new vision for Macquarie Point and update them on the progress to date.

9.3. If the Minister agrees to prepare an amendment as requested by the Board, Council has the ability to undertake public consultation for a 28 day period prior to making a representation in relation to the draft amendments. Given that the amendments are not following the usual LUPAA amendment process it is recommended that this 28 day public consultation process be conducted.

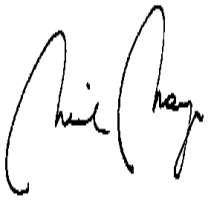
10. Delegation

10.1. If the Minister agrees to prepare an amendment as requested by the Board, Council has 14 days in which to advise the Minister that public consultation will be undertaken.

10.2. Given the short time frame provided under the MPDC Act, it is proposed that Council delegate to the General Manager the authority to give notice to the Minister under section 39H(4) of the MPDC Act that Council intends to seek representations from the public.

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

James McIlhenny
MANAGER PLANNING POLICY AND HERITAGE



Neil Noye
DIRECTOR CITY PLANNING

Date: 9 January 2019
File Reference: F17/56953; 32-3-93

Attachment A: Amendment Request Notice ⇩
Attachment B: Draft Planning Scheme Amendments ⇩
Attachment C: MPDC Planning Report ⇩
Attachment D: MPDC Act Amendment Flow Chart ⇩
Attachment E: MPDC Act Division 3 ⇩

Macquarie Point Development Corporation

GPO Box 251
Hobart Tasmania 7001
macquariepoint.com

ABN 92 657 409 841

Mr Nick Heath
General Manager
City of Hobart
50 Macquarie Street
HOBART TAS 7000

Dear Mr Heath

Proposed amendments to the planning arrangements at Macquarie Point

Macquarie Point (Mac Point) represents an exciting and unique opportunity for Hobart and our State.

The site links together key destinations and activity centres in the city between the Queens Domain, the Regatta Grounds, Sullivans Cove, Salamanca, the waterfront and Hobart's CBD.

It represents the opportunity to facilitate community, social and cultural celebrations and engagement, as well as a hub for arts and culture, innovation, scientific research and design excellence.

However, to enable the Macquarie Point Development Corporation (Corporation) to bring the site to life, there is a requirement to update the *Sullivans Cove Planning Scheme 1997* to reflect the revised masterplan for the site and to bring the planning arrangement in line with stage 1 of the Mona vision.

The *Macquarie Point Development Corporation Act 2012* (the Act) provides a process to do this, where the Corporation's Board can request the Minister for State Growth consider making amendments to the planning scheme.

I am contacting you to advise that the Board intends to make such a request and am providing a copy of the planning amendments we intend to seek (attached).

Before making that request, on behalf of the Board I would like to invite you to provide feedback and make representations as appropriate in relation to the attached proposed planning amendments.

This process is outlined under the Act in S39G(3) and S39G(4) which sets the timeframe for representations to the Board of 21 days. Therefore, in the first stage of the planning approval process it would be appreciated if the Council could provide a formal response to the Corporation by 23 January 2019.

Upon the receipt of your formal response, the Board must consider all representations and determine whether or not to amend the proposed request and the draft of the amendments.

The process following the Board's consideration of the outcomes of the consultation, is a formal Report to the Minister as set out under S39G(8).

It is then the Minister's decision as to whether the draft amendments will be pursued. If supported, the draft amendments along with the supporting suite of documents will be submitted to the Hobart City Council for its consideration.

In addition, I refer to your Director for Planning's letter dated 30 October 2018.

Thank you for your feedback on the draft amendments to the Macquarie Point Site Development Plan.

The revised version of the planning report and amendments integrates the Council's comments. I note the following:

- The Corporation will provide a 'show revisions' document upon finalisation of the amendments to guide the public's understanding of the revisions made.
- Table 32.3 has now been included in the draft amendments.

View lines:

- The planning report has been amended to reflect reorganisation of the site under the Reset Masterplan with view lines 3 and 4 amended and replaced with views 9 and 10.
- A new view line 11 has also been added from the Cove Floor back to the Cenotaph to the NW.

Use Tables:

- Exhibition centre is defined under Part G the Sullivans Cove Planning Scheme. This definition will apply to the Site Development Plan.

Changes to Use Table 32.5.1 for Arts and Institutional Use Area

- Reapply the three Use Areas as shown below with a replacement Figure 32.1;
- Rename the Commercial and Institutional Use Area 1 to Arts and Institutional;
- Remove Gambling Premises, Hospital Services and Recreational Boating Facility Uses from the Use Table at 32.5.1. Those Uses are not considered either desirable or practical under the Reset Masterplan and consequently are now proposed to be prohibited;
- Insert Light Industry as a Discretionary Use to allow consideration of small manufacturing or processing uses that will not cause a nuisance and be compatible with the character of the area;
- Move Passive Recreation from Discretionary to an Exempt Use;
- Insert Exhibition Centre and Minor Sport and Recreation as Permitted Uses;
- Insert Commercial Port Operations as a Discretionary Use to allow for a transition to the working port;
- Remove Recreational Boating Facility as a Discretionary Use with the effect that is now Prohibited within this Art sand Institutional Area; and

- Inserts Major Sport and Recreation, Railway Terminal and Service Industry as Discretionary Uses. Major Sport and Recreation is already a Discretionary Use in the Mixed Use Area under the existing Site Development Plan. It is considered appropriate that such Uses can be considered given the intention for Mac Point to act as a major public event space.

Existing Figure 32.1 ***Proposed replacement Figure 32.1***

Changes to Use Table 32.5.2 for Mixed Use Area

Amend the Use Table at 32.5.2 to:

- Move Passive Recreation from Discretionary to an Exempt Use;
- Insert Childcare Centre and Exhibition Centre as a Permitted Uses;
- Insert Manufacturing Sales as a Permitted Use in the Goods Shed with that use otherwise remaining Discretionary;
- Move Minor Sport and Recreation from Discretionary to Permitted and Inserts Major Sport and Recreation as a Discretionary Use;
- Insert Light Industry as a Discretionary Use for the reasons discussed above;
- Amend the use condition for Car Park to continue the Permitted status of a carpark adjacent to the escarpment given the change from Open Space Area to Mixed Use area under replacement Figure 32.1 (currently permitted in the same location);
- Insert a new Use Condition for Residential Accommodation to make it only permitted in Areas 2.1 and 2.2 of Figure 32.1 where above ground floor level (except for access);

- Remove Recreational Boating Facility on the basis that this Use Area does not have direct access to the water and is therefore, not suitable for marinas and the like; and
- Insert Warehouse as a Discretionary Use.

Changes to Use Table 32.5.3 for Open Space Use Area

Amends the Use Table at 32.5.3 to:

- Remove the reference to the 'Escarpment Park' from the use condition for Car Park in the Open Space Area to reflect the amended spatial application of the Use areas under Figure 32.1. The Permitted status for a carpark adjacent to the escarpment is maintained through an amendment to the Car Park use condition;
- Insert Car Park as a Discretionary Use on the condition that the use is underground. The Interim Use Clause will allow for the granting of a temporary planning permit for parking on grade; and
- Insert Research and Development Centre as a Discretionary Use subject to the condition that the use is directly associated with a use in the Arts and Institutional Area. This would allow for the possibility of some connection for a research and development complex between the two Building Areas on either side of the Key Public Space. Any associated development would be outside the permitted building envelopes under Figure 32.3 and subject to the desired Future Character Statements, including the need to preserve important view lines and the central Key Public Space.

Use Standards:

- Section 32.6.2 has been amended to apply more generally to Residential and Visitor Accommodation Uses throughout the site to protect residential amenity and reduce land use conflict.
- The standard has also been amended to require Residential Uses to protect themselves from noise disturbance from amplified music in event spaces.

Building form:

- Following advice from Leigh Woolley the building envelopes on the eastern side of the escarpment have been revised on Figures 32.3 and 32.4 and are now setback from the toe of the escarpment and to maintain a view corridor to the SE to allow views back to the Cenotaph from the Cove Floor.
- P1 of clause 32.7.2 has been amended to ensure that buildings adjacent to the headland do not protrude above the escarpment when viewed from the Cenotaph.

Building Alignment:

- Clause 32.7.3 A1 has been amended such that buildings located within the Building Areas on Figure 32.3 and within 20m of a frontage to a primary or secondary space are to align the edge of that space for a minimum of 70 per cent of the width of the building facing that frontage.

Building Form:

- The pedestrian link through building C is covered by clause 32.7.11 - provide a 6m wide publicly accessible link within 10m of the pedestrian link as shown on Figure 32.3. The intent is to provide flexibility for the exact location to move around if necessary to accommodate a specific building footprint.

Please do not hesitate to contact the CEO should you wish to discuss how the Corporation has integrated the Council's comments into the amendments.

It should be noted that if the Council exercises the option under s39G(5) of the Act, which is if the Council resolves not to support all or part of the proposed planning amendments, I would appreciate your advice on the Council's view as to the amendments which would be required to be made to address concerns.

Feedback on the first stage is to be provided to the CEO, Mary Massina on mary@macquariepoint.com or posted to GPO Box 251, Hobart 7001 by 23 January 2019.

Any questions please contact the CEO either via email or 0408 594 312.

Yours sincerely,

Brian Scullin
Chairman
2 January 2019

Attachment: Planning Scheme Amendments to *Sullivans Cove Planning Scheme 1997*

Amendments to Sullivans Cove Planning Scheme 1997

Amendment - 1

Amend the parking policy objectives for the Sullivans Cove 'Gateway' Activity Area 3.0 under Section 26.3 of the SCPS1997 as follows:

Activity Area 3.0 will balance a prioritisation of pedestrian and cycling access to the Macquarie Point site with the need to provide for efficient private vehicle access and the requirement to maintain heavy vehicle access to the port.

The Macquarie Point site will be reconnected to its surrounds through the introduction of a number of pedestrian and cycle links~~. The Escarpment Park will connect~~ connecting the city and Sullivans Cove to the Regatta Grounds and beyond~~, and similarly the Water to Water Promenade will connect Sullivans Cove to the Regatta Grounds~~. It will be possible to move from the Gateway Park, Evans Street and Regatta Grounds ~~these pathways~~ through the network of shared streets and lanes to the Key Public Space ~~to the north of the Goods Shed~~ at the heart of the site shown on Figure 32.3 Macquarie Point Development Framework Plan.

The network of shared streets and lanes is scaled at a width that allows a number of configurations; they can be open to one or two-way traffic, or closed to traffic altogether over the course of a single day. Access by emergency and service vehicles will be possible through removable bollards. A series of public open spaces or pocket parks will sit within this pedestrian-oriented network.

The Evans Street frontage offers a convenient arrival point to the Macquarie Point site. Some onstreet car parking will be provided along this edge; however, access for vehicular traffic into the site will be limited. Cars will generally be limited to the access links identified in the Development Framework of the Macquarie Point Site Development Plan, with car parking structures located immediately behind the buildings on Evans Street. Only a small amount of on-street car parking will be provided within the Macquarie Point site. Development including new on-site car parking must demonstrate that the associated traffic movements can be accommodated within the surrounding road network.

A pedestrian and cycle link to connect the city to the Regatta Grounds and beyond will be provided through the site~~ positioned where the Tasman Highway enters Davey Street~~. with commuter bicycle parking and change facilities where the link connects with the road network at the southern end ~~will be provided at this location~~.

A public car park is proposed adjacent to the escarpment, with access from the Tasman Highway.

Future transportation corridors will be preserved for the movement of public transport and heavy vehicles.

Note: additions to existing clauses shown as underline, deletions to existing clauses shown as strikethrough

Amendment – 2

Replace Section 32 of the SCPS1997 as follows:

32.0 Macquarie Point Site Development Plan

32.1 Purpose of the Site Development Plan

32.1.1 To implement the Macquarie Point Reset Masterplan 2017-2030.

32.1.2 To ensure that Macquarie Point is redeveloped:

(a) as a vibrant and active area, with a mix of uses, that connects with and complements adjacent areas within Hobart;

(b) to encourage inner city living;

(c) to deliver sustainable social and economic benefits to Hobart;

(d) in accordance with sound planning, urban design and environmental principles; and

(e) to protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy.

32.2 Application of the Site Development Plan

32.2.1 Planning Area

This Site Development Plan applies to the area of land designated as 'Macquarie Point Site Development Plan' on Figure 4 of this Scheme.

32.2.2 Control of Use and Development

Subject to the other relevant requirements of this Scheme, the Planning Authority is bound to grant a permit for applications for 'use' and 'development' designated as 'permitted' in all of the relevant provisions of this Site Development Plan, but may impose conditions.

The Planning Authority has a discretion to refuse or permit applications for 'use' and 'development' designated as 'discretionary' in any of the relevant provisions of this Site Development Plan and may impose conditions.

All other 'uses' and 'development' are 'prohibited'.

32.2.3 Exempt Development

The following development is exempt from requiring a permit:

(a) Works associated with the investigation of land contamination;

(b) Public art;

(c) Maintenance and repair by or on behalf of the State Government, a Council, a statutory authority, or a corporation all the shares of which are held by or on behalf of the State or by a statutory authority, of:

i. Electricity, gas, sewerage, stormwater and water reticulation to individual streets, lots or buildings;

ii. Infrastructure such as roads, rail lines, footpaths, cycle paths, drains, sewers, power lines and pipelines; and

iii. Minor infrastructure such as footpaths and cycle paths, playground equipment, seating and shelters, telephone booths, post boxes, bike racks, fire hydrants, drinking fountains, rubbish bins, public art, traffic control devices and markings, and the like on public land.

32.2.4 Land decontamination

The undertaking of works to remediate land are permitted.

32.2.5 Definitions

Activity Centre Network	Means the Activity Centre Network in Table 1 of the *Southern Tasmania Regional Land Use Strategy 2010 - 2035*.
Cove Floor	The reclaimed areas of Macquarie Point to the east of the Natural Shoreline shown on Figure 32.3.
Environmental Audit	Means a report prepared by a Suitably Qualified Person (Site Contamination) on the nature, extent and levels of existing contamination and the actual or potential risk to human health or the environment, on or off the site, resulting from that contamination, prepared in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 16 May 2013.
Environmental Harm	Means 'environmental harm' as described in section 5 of the *Environmental Management and Pollution Control Act 1994* and includes an environmental nuisance.
Environmental Nuisance	Means an 'environmental nuisance' as described in section 3 of the *Environmental Management and Pollution Control Act 1994*.
Height	For development inside the areas shown on Figure 32.4 means the uppermost part of a building excluding minor protrusions such as aerials, antennae, solar panels, chimneys and vents measured in Australian Height Datum (AHD). For development outside the areas shown on Figure 32.4, the vertical distance from existing ground level at any point to the uppermost part of a building directly above that point, excluding minor protrusions such as aerials, antennae, solar panels, chimneys and vents.
Primary Space	Key Public Spaces shown on Figure 32.3, and Evans Street.
Secondary Space	Smaller roads, lanes, alleys and ad hoc courts shown as Important Pedestrian Links shown on Figure 32.3.
Sensitive Use	Means a residential use or a use involving the presence of people for extended periods of time, except in the course of their employment, such as a caravan park, childcare centre, dwelling, hospital or school.

Site-Specific Report	Means an environmental impact assessment carried out by a Suitably Qualified Person (Emissions), which meets the technical components of section 74 of the *Environmental Management and Pollution Control Act 1994* and includes the impact of building design, layout and construction of the development to eliminate, mitigate or manage effects of emissions to ensure that a proposed use will not be unreasonably impacted by environmental harm caused by the operations of the Macquarie Point Wastewater Treatment Plant.
Suitably Qualified Person (Emissions)	Means a person who, in the opinion of the planning authority, can demonstrate that a proposed use will not be unreasonably impacted by environmental harm caused by the operations of the Macquarie Point Wastewater Treatment Plant.
Suitably Qualified Person (Site Contamination)	Means a person appointed as an accredited environmental auditor in accordance with section 39F of the *Macquarie Point Development Corporation Act 2012*.

32.2.6 Interim Use and Development

Notwithstanding the requirements of Clauses 32.3, 32.5, 32.7.1, 32.7.2, 32.7.3, 32.7.4, 32.7.5, 32.7.6, 32.7.7, 32.7.8, 32.7.10 and 32.10, the Planning Authority has discretion to approve temporary use and development for a period not exceeding 5 years providing buildings are located and designed in a manner that does not prejudice the future development of the area or appropriate pedestrian, cycle and vehicle linkages through the site to adjacent Activity Areas.

32.3 Desired Future Character Statements

Desired Future Character Statements	Implementation Strategy
Development of Activity Area 3.0 will: 32.3.1 Re-engage with its history by revealing layers of the changing nature of Macquarie Point over time through expression of the topography, natural shoreline, Round House, Goods Shed, Royal Engineers Building and Red Shed. 32.3.2 Ensure that development respects the setting and appreciation of the cultural heritage significance of the Royal Engineers Building. 32.3.3 Ensure that development does not adversely impact on the cultural heritage and reverential ambience of the Hobart Cenotaph and its surrounds. 32.3.4 Acknowledge the footprint of the former railway Round House as shown on Figure 32.3 and the associated Table 32.3. 32.3.5 Protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy by: • Providing a buffer of non-sensitive uses in the buildings along the port interface to avoid constraints on the working port; • Ensuring that sensitive uses are separated and treated so as not to be vulnerable to noise, air, vibration and lighting impacts; • Incorporating appropriate design responses to avoid conflict between mixed-use, pedestrian and industrial vehicular traffic associated with the Port of Hobart along Evans Street; • Ensuring compliance with relevant safety and hazard distances as specified in relevant Australian	Use and Development Standards and clause 32.4.

Desired Future Character Statements	Implementation Strategy
standards; and • Preserving the opportunity for a future connection to the Port of Hobart from the north via the Regatta Grounds. 32.3.6 Provide for recreation and associated uses in designated open spaces as shown on Figure 32.3 and the associated Table 32.3. 32.3.7 Ensure that the bulk, siting and height of buildings are sympathetic to the natural topography of the headland, amphitheatre, and escarpment surrounding the Cenotaph and reinforce the natural shoreline with freestanding buildings viewed in the round on the Cove Floor. 32.3.8 Not unreasonably impact on important views, including the following shown on Figure 32.2: • From the Cenotaph toward the mouth of the Derwent River, including the flat river plane that extends to the horizon; • From the Cenotaph to the horizon of the natural amphitheatre, including the Wellington Range descending to the Mount Nelson ridge, then to Porter Hill and down to the water plane at Long Point, Lower Sandy Bay; • From the Cenotaph to St George's Church; • From the Cenotaph to the Parliament House forecourt along Morrison Street; • The views across the Cove toward the Cenotaph, including from Macquarie Street, the forecourt of the Princes Wharf No. 1 Shed; the Paddock between Princes Wharf No. 1 Shed and the Institute for Marine and Antarctic Studies (IMAS), Runnymede Street and the open space at the eastern end of the IMAS building;	

Desired Future Character Statements	Implementation Strategy
• The view of the sunrise from the grounds of the Cenotaph on Anzac Day; • To and from Sullivans Cove and the Derwent River aligning NE/SW; • From the Royal Engineers Building to Kangaroo Bay; • Along the Key Public Space; and • To and from the Key Public Space and Cove Floor to the Cenotaph. 32.3.9 To and from Davey Street and the entry to the Key Public Space.Ensure that the design and appearance of roofs provide interest when viewed from the elevated areas of the Cenotaph and Domain through measures that may include incorporation of, rooftop gardens or articulated roof forms that serve a purpose such as daylighting of internal areas. 32.3.10 Establish and reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site. 32.3.11 Include a network of connections through and around the site as shown on Figure 32.3 and the associated Table 32.3, including a series of: • Primary shared street spaces extending north from Evans Street and east from Tasman Highway towards the centre of the site; and • Smaller and more intimate secondary spaces that provide permeability across the site. Their position can be adjusted to suit the preferred building form, siting and lot size/s. 32.3.12 Include a direct pedestrian link between the Key Public Space and Cenotaph that traverses the escarpment.	

32.3.13	Include a gateway building in area D shown on Figure 32.3 that provides interest and maintains view lines at ground level to the Key Public Space from Davey Street and forms the southern edge of the central Key Public Space; and	
32.3.14	Ensure that developments for noise sensitive uses are adequately designed and constructed to protect residential amenity and reduce the potential for land use conflict that may compromise the use of Macquarie Point as a major public event space.	

32.4 Matters to be Considered

In considering applications and any conditions to be imposed on 'use' and 'development', the Planning Authority must consider:

- The Desired Future Character Statements in clause 32.3;
- The preferred treatment of robust, self-pigmented external materials and finishes to primary and secondary spaces;
- The suitability of proposed development to achieve satisfactory levels of safety and amenity of occupants including the avoidance of vulnerability to noise, air, vibration and lighting impacts from the Port of Hobart;
- The potential for land use conflict between the proposed use and development and the use of Macquarie Point for major public events;
- The impact on the operation of the Port of Hobart;
- The height of buildings within Activity Area 3.0, and on adjoining and adjacent lots;
- The bulk and form of existing and proposed buildings;
- The spatial characteristics of the streets and spaces and the quality of the environment;
- Protection of water quality and water sensitive urban design principles;
- Protection of public infrastructure and the environment;
- Impacts from land decontamination works, and the need for uses not to commence until relevant areas of the site have been appropriately remediated;
- The quality of the architectural design;
- The adequacy and capacity of existing infrastructure and services including roads, footpaths, water, sewerage and power to cater for the proposed development; and
- The Strategic Principles in Appendix A of the Macquarie Point Reset Masterplan 2017-2030.

32.5 Use Table

The 'Macquarie Point Site Development Plan' area is divided into three use area types as shown on Figure 32.1.

32.5.1 Uses within Use Area 1: Arts and Institutional Area

Use Class	Condition
Exempt	
Occasional sporting, social and cultural events	
Passive Recreation	
Permitted	
Art and Craft Centre	
Arts and Cultural Centre	
Car Park	Except if on ground floor level and within 8 metres of the front of a building that faces a primary or secondary space.
Community Centre	
Eating Establishment	
Education Centre	Except for secondary or primary school
Exhibition Centre	
Function Centre	
Market	
Minor Sport and Recreation	
Office	
Public Display Office	
Public Transport Facility	
Research and Development Centre	
Shop	
Utility Installation	
Discretionary	
Commercial Port Operations	
Hotel	Except for accommodation
Light Industry	
Major Sport and Recreation	
Manufacturing Sales	

Place of Worship	
Railway Terminal	
Service Industry	
Transport Terminal	
Warehouse	
Prohibited	
All other uses	

32.5.2 Uses within Use Area 2: Mixed Use Area

Use Class	Condition
Exempt	
Occasional sporting, social and cultural events	
Passive Recreation	
Permitted	
Art and Craft Centre	
Arts and Cultural Centre	
Car Park	Except if not adjacent to the escarpment and on ground floor level and within 8 metres of the front of a building that faces a primary or secondary space
Child Care Centre	
Community Centre	
Eating Establishment	
Education Centre	
Exhibition Centre	
Function Centre	
Hospital Services	
Hotel	Only if above ground floor level where fronting Evans Street.
Market	
Manufacturing Sales	Only if in the Goods Shed
Minor Sports and Recreation	
Office	

Place of Worship	
Public Display Office	
Public Transport Facility	
Railway Terminal	
Research and Development Centre	
Residential Accommodation	Only if in Areas 2.1 and 2.2 on Figure 32.1 and above ground floor level except for access.
Shop	
Utility Installation	
Visitor Accommodation	Except if on ground floor level and within 8 metres of the front of a building that faces a primary or secondary space.
Discretionary	
Light Industry	
Major Sport and Recreation	
Manufacturing Sales	
Transport Terminal	
Warehouse	
Prohibited	
All other uses	

32.5.3 Uses within Use Area 3: Open Space Area

Use Class	Condition
Exempt	
Occasional sporting, social and cultural events	
Passive Recreation	
Permitted	
Car Park	Only in the Art School car park (47 Hunter Street) or associated with the use of the Royal Engineers Building.
Community Centre	

Market	
Office	Only in the Royal Engineers Building.
Public Transport Facility	
Discretionary	
Art and Craft Centre	
Arts and Cultural Centre	
Car Park	Only if underground
Child Care Centre	
Eating Establishment	
Minor Sports and Recreation	
Railway Terminal	
Recreational Boating Facility	
Research and Development Centre	Only if directly associated with a use n the Arts and Institutional Area.
Shop	
Transport Terminal	
Utility Installation	
Prohibited	
All other uses	

32.6 Use Standards

32.6.1 Mixed Use

Objective:	To ensure that Activity Area 3.0 is developed with a mix of uses.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 The total combined floor area of the following uses does not exceed: (a) Shop: 10,000 m^2 (b) Research and Development Centre and Education Centre: 35,000 m^2 (c) Office: 30,000 m^2 (d) Residential Accommodation: 15,000m^2 (e) Hotel and Visitor Accommodation: 20,000 m^2	P1 Uses must contribute to the interest and activity of Macquarie Point as a mixed use area having regard to the following: (a) Provide for a diversity of uses at densities responsive to the character of streetscapes and public spaces; (b) Encourage use at street level that generates activity and pedestrian movement through the area; (c) Ensure that shop and office uses are consistent with the Activity Centre Network and do not have an unacceptable impact on the Hobart CBD.

32.6.2 Residential and Visitor Accommodation Uses

Objective:	(a) Ensure appropriate levels of safety and amenity for residential and visitor accommodation; (b) Protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy; and (c) Protect the viability of Macquarie Point as a major public event space

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Residential or Visitor Accommodation development must demonstrate that design elements are able to achieve internal noise levels in accordance with relevant Australian Standards for acoustics control (including AS3671:1989 – *Road Traffic Noise Intrusion (Building Siting and Construction)* and AS2107:2000 – *Acoustics (Recommended Design Sound Levels and Reverberation Times for Building Interiors)*).	P1 Residential or Visitor Accommodation development is adequately protected from environmental harm from noise from transport movements, the operational port and likely noise from major public events at Macquarie Point.

32.6.3 Car Parking

Objective:	To ensure that traffic movements associated with car parking use can be accommodated safely within the surrounding road network.

Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 The total number of car parking spaces in Activity Area 3.0, excluding Area A shown on Figure 32.4, must not exceed 350 spaces.	P1 Traffic impacts associated with car parking must be safe and minimise any adverse impact on the efficiency of the road, having regard to: (a) The increase in traffic caused by the car parking; (b) The nature of the traffic generated by the car parking; (c) The surrounding road conditions; (d) The need for the use; (e) Any traffic impact assessment; and (f) Any proposed engineering works or traffic management arrangements.

32.7 Development Standards for Buildings or Works

32.7.1 Impacts from the Working Port

Objective:	(a) Ensure appropriate levels of safety and amenity for occupants of buildings; and (b) Protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Buildings: (a) Within 50 metres of the boundary adjoining the Port of Hobart must include design elements that are able to achieve internal noise levels in accordance with the relevant Australian Standards for acoustics control (including AS3671:1989 – *Road Traffic Noise Intrusion (Building Siting and Construction)*, and AS2107:2000 – *Acoustics (Recommended Design Sound Levels and Reverberation Times for Building Interiors)*); (b) Within 20 metres of the boundary adjoining the Port of Hobart must not have private outdoor areas, decks or balconies; and (c) Within 10 metres of the boundary adjoining the Port of Hobart must only have fixed windows (non-opening).	P1 Buildings are adequately protected from noise arising from port activities including the movement of heavy vehicles to safeguard occupants' health and amenity.

32.7.2 Building Form

Objective:	Ensure the height and form of buildings are: (a) Consistent with established building forms within Sullivans Cove; (b) Sympathetic to the natural topography of Sullivans Cove, including the amphitheatre sloping down to the Cove with the headland and escarpment surrounding the Cenotaph forming a natural expression of the Cove Wall; (c) Respectful of the low-lying nature of the site and its visibility from surrounding elevated areas.	
Deemed to Comply (Permitted)		**Performance Criteria (Discretionary)**

A1	P1
Building height must be no more than: (a) The permitted heights for areas shown in Figure 32.4 and associated Table 32.3; or (b) 6 metres if outside the areas shown on Figure 32.4 and associated Table 32.3	Building height is consistent with the streetscape, urban form and character of the surrounding area, having regard to: (a) The Desired Future Character Statements in clause 32.3; (b) The protection of important views shown in Figure 32.2; (c) The apparent height when viewed from the Cenotaph and the southern side of the Cove; (d) The overshadowing of existing and proposed buildings and of the Key Public Spaces as shown in Figure 32.3 and the associated Table 32.3; (e) The individual prominence of the building and its contrast with neighbouring buildings; (f) The architectural and design merit of the building itself; (g) The contribution the building will make to Macquarie Point and the City of Hobart more generally in terms of architectural character and quality; (h) The extent and nature of the contribution that the building and its use will make to the economic activity of Macquarie Point and in the City of Hobart; (i) The extent and nature of the contribution that the building and its use will make to the reputation of the City of Hobart as an international destination; and (j) The civic amenity of the building. Buildings sited adjacent to the headland are not to protrude above the escarpment when viewed from the Cenotaph.

A2 There is no Deemed to Comply standard for roof form for buildings with a floor area greater than 300m^2.	P2 Roof form: (a) Contributes to the articulation of building form; (b) Contributes to the integration of new buildings into the surrounding area; and (c) Provides architectural interest when viewed from elevated areas.
A3 Buildings are sited within the areas shown in Figure 32.3 and the associated Table 32.3.	P3 Building form minimises apparent size and bulk having regard to: (a) The Desired Future Character Statements in clause 32.3; (b) The facilitation of secondary spaces; (c) The visual prominence of the building when viewed from public spaces; and (d) The use of design measures such as vertical articulation.

32.7.3 Building Alignment

Objective:	To ensure that the alignment of buildings forms roads and other public spaces.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 Buildings located within the Building Areas on Figure 32.3 and within 20m of a frontage to a primary or secondary space are to align the edge of that space for a minimum of 70% of the width of the building facing that frontage.	P1 Buildings must: (a) be sited and aligned having regard to the Desired Future Character Statements in clause 32.3 and the intended spaces shown on Figure 32.3 and associated Table 32.3; and (b) Where fronting onto a primary or secondary space, the alignment of buildings may include irregular shapes provided that the overall impression is of retention of continuous alignment of the space.

32.7.4 Building Alignment to Evans Street

Objective:	Establish and reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Building setback from Evans Street must be 3 metres.	P1 Building setback must: (a) Be compatible with the setback of adjoining buildings and the streetscape; (b) Only be sited closer to Evans Street where it can be demonstrated that it is sufficiently setback from the alignment of the Goods Shed to highlight that building within the streetscape; and (c) Only provide variations in building alignment to break up long building façades, provided that no potential concealment or entrapment opportunities are created.

32.7.5 Building Alignment – Adjacent to the escarpment (Use Area 2 adjacent to the escarpment on Figure 32.1)

Objective:	To ensure that the siting and alignment of buildings adjacent to the escarpment are sympathetic to the natural topography of the headland, amphitheatre and escarpment surrounding the Cenotaph and reinforce the natural shoreline.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Buildings adjacent to the escarpment are sited in Area A shown on Figure 32.4.	P1 Buildings must be sited and aligned having regard to the Desired Future Character Statements in clause 32.3.

32.7.6 Design

Objective:	To ensure that building façades promote and maintain high levels of pedestrian interest, amenity and safety.

Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 Buildings must comply with the following: (a) Provide the main pedestrian access to the building so that it is visible from the road or publicly accessible areas of the site; (b) Ground floor façades facing a primary or secondary space must comprise a surface area of no less than 40 per cent consisting of windows or doorways; and (c) Ground floor facades facing a primary or secondary space must not comprise a single length of blank wall greater than 30 per cent of the total façade on that frontage.	P1 Buildings must be designed to enhance the streetscape by: (a) Providing a pedestrian access to the building that addresses the street or other public place; (b) Providing for passive surveillance of public spaces; and (c) Treating large expanses of blank wall in the front façade and façades facing other public space boundaries with architectural detail or public art so as to contribute positively to the streetscape and public space.
A2 Mechanical plant and other service infrastructure, such as heat pumps, air conditioning units, switchboards, hot water units and the like, must not be visible from the street and other public places.	P2 Mechanical plant and other service infrastructure, such as heat pumps, air conditioning units, switchboards, hot water units and the like, when viewed from the street or other public places, must not detract from: (a) The visual qualities of the streetscape; and (b) The amenity of pedestrians through noise, air movement, dust or similar.
A3 Security shutters or grilles must not be fitted over windows or doors on façades facing a primary or secondary space or other public place.	P3 Security shutters or grilles over windows or doors on a façade facing the frontage or other public spaces are only provided if it is essential for the security of the premises and no other alternatives are feasible.

32.7.7 Roof Mounted Mechanical Plant

Objective:	Rooftop mechanical plant is to be unobtrusive when viewed from elevated areas including the Cenotaph and surrounding areas.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Buildings are to achieve one or more of the following: (a) Roof-top mechanical plant and service infrastructure, including lift structures, must be contained within the roof; (b) Roof-top mechanical plant is to be screened from public view including from the Cenotaph and surrounding areas.	P1 Rooftop mechanical plant is to be sited and treated so as to be unobtrusive when viewed from the Cenotaph and surrounding areas.

32.7.8 Outdoor Storage Areas

Objective:	To ensure outdoor storage areas do not visually detract from the area.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Outdoor storage areas must: (a) Be located behind the façade of the building; and (b) All goods and materials stored must be screened from public view.	P1 Outdoor storage areas must be located, treated or screened to minimise adverse impacts on the visual amenity of the area.

32.7.9 Inundation Hazard

Objective:	To ensure the risk from coastal inundation is appropriately managed.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 The finished floor level of a habitable room must be not less than 2.8 metres above the Australian Height Datum (AHD).	P1 No performance criteria.

32.7.10 Pedestrian Links

Objective:	To provide a network of pedestrian connections.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 A minimum 6 metres wide publicly accessible pedestrian lane or arcade is provided within 10 metres of a pedestrian link shown on Figure 32.3 and the associated Table 32.3.	P1 Buildings must compliment a network of pedestrian connections having regard to: (a) The Desired Future Character Statements in clause 32.3; and (b) The Strategic Principles in Appendix A of the Macquarie Point Reset Masterplan 2017-2030.

32.8 Development Standards for Subdivision

32.8.1 Subdivision

Objective:	To ensure that subdivision of land is consistent with achieving the desired layout of buildings and spaces and occurs in a coordinated manner with its use and development.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 Each lot must: (a) Have an area, dimensions and layout consistent with the building areas within the Macquarie Point Development Framework Plan as shown in Figure 32.3 and the associated Table 32.3; (b) Be required for public use by the State Government, a Council, a statutory authority, or a corporation all the shares of which are held by or on behalf of the State, Council or by a statutory authority; or (c) Be required for the provision of Utilities.	P1 (a) Subdivision of land is for the purposes of facilitating the desired use and development of land having regard to the layout of buildings and spaces outlined in the Macquarie Point Development Framework Plan as shown in Figure 32.3 and the associated Table 32.3 and forms part of an application for that use and development; or (b) Subdivision of land ensures that each lot: i. has a sufficient area, dimensions and frontage to public space for its intended use; ii. provides for sufficient spaces and connection through the site; and iii. facilitates the articulation of building form by minimising building bulk; and iv. does not frustrate the opportunity for a future alternative access to the Port of Hobart via the Regatta Grounds from the north: having regard to the desired layout of building and spaces shown in Figure 32.3 and the associated Table 32.3, the location of existing and approved buildings and the Desired Future Character Statements in clause 32.3.

A2 Each lot must have a frontage, or legal connection to a road by a right of carriageway, of not less than 3.6 metres.	P2 Each lot, must be provided with a frontage or legal connection to a road by a right of carriageway, that is sufficient for the intended use, having regard to: (a) The number of other lots which have the land subject to the right of carriageway as their sole or principal means of access; (b) The functionality and usability of the frontage or access; (c) Existing or intended adjoining public space through which occasional vehicular access may be granted; (d) The anticipated nature of vehicles likely to access the site; (e) The ability to manoeuvre vehicles on the site; (f) The ability for emergency services to access the site; and
A3 Each lot, excluding for public open space or utilities, must be capable of a connection to: (a) A reticulated potable water supply; (b) A reticulated sewerage system; and A public stormwater system able to service the building area by gravity.	P3 No performance criteria.

32.9 Heritage

The heritage provisions of Schedule 1 of the Scheme apply.

32.10 Public Urban Space

32.10.1 Prior to development within the Primary Spaces or Secondary Spaces, a planning permit is required for a civic works concept plan. The plan is to show the extent of intended civic works, including provision of essential services infrastructure, public amenities, paving, planting, location of all fixed street furniture, including trees and ground covers, artworks, free standing signs, lights and lighting concept. It is to be prepared having

regard to the Desired Future Character Statements in clause 32.3 and Matters to be Considered in clause 32.4.

32.10.2 A permit is not required for development in accordance with an approved civic works concept plan.

32.11 Signage

The Signage provisions of Schedule 4 of the Scheme apply.

32.12 Traffic, Access and Parking

The Traffic, Access and Parking provisions of clause 32.6.3 and Schedule 5 of the Scheme apply. The provisions of clause 32.6.3 prevail over Schedule 5 of the Scheme to the extent of any inconsistency.

32.13 Demolition

The Demolition provisions of Schedule 7 of the Scheme apply.

32.14 Environmental Management

32.14.1 If an accredited environmental auditor has provided a certification in accordance with section 39F(1) of the *Macquarie Point Development Corporation Act 2012*, then the land contamination objectives of Schedule 8 – Environmental Management, do not apply to any use or development which is the redevelopment referred to in such certificate.

32.14.2 In determining the grant of a permit for any application for use and development within the 'Macquarie Point Site Development Plan', the planning authority must not impose any condition or restriction in a planning permit which is inconsistent with, or imposes any additional requirements to, a certificate from an accredited environmental auditor given pursuant to section 39F of the *Macquarie Point Development Corporation Act 2012*.

32.14.3 The planning authority may grant a planning permit for remediation of any part of the land within the 'Macquarie Point Site Development Plan' the effect of which is conditional upon the grant of a certificate by an accredited environmental auditor pursuant to section 39F of the *Macquarie Point Development Corporation Act 2012* and may do so in anticipation of the grant of such certificate.

32.14.4 Where an accredited environmental auditor has granted a certificate in accordance with section 39F of the *Macquarie Point Development Corporation Act 2012* in relation to a proposed development or use, then the provisions of Schedule 8 – Environmental Management, do not apply in relation to the remediation of the land the subject of the certificate.

32.14.5 Subject to the above clauses, Schedule 8 – Environmental Management, applies to the use and development of land as identified in the 'Macquarie Point Site Development Plan'.

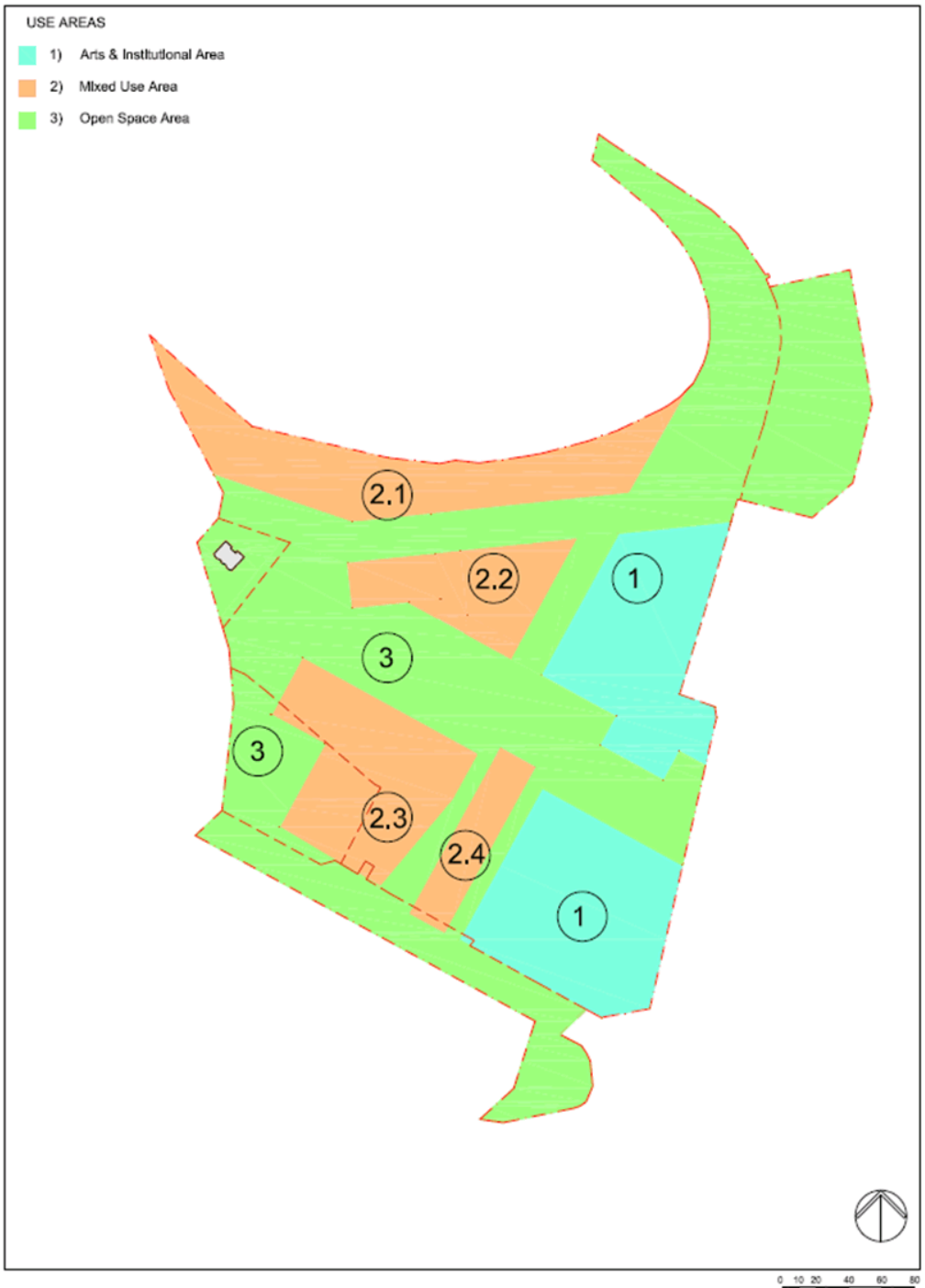
32.14.6 Attenuation from the Macquarie Point Wastewater Treatment Plant

Objective:	To ensure that sensitive uses are separated from or do not conflict with, interfere with, or constrain the Macquarie Point Wastewater Treatment plant to mitigate any adverse effects.

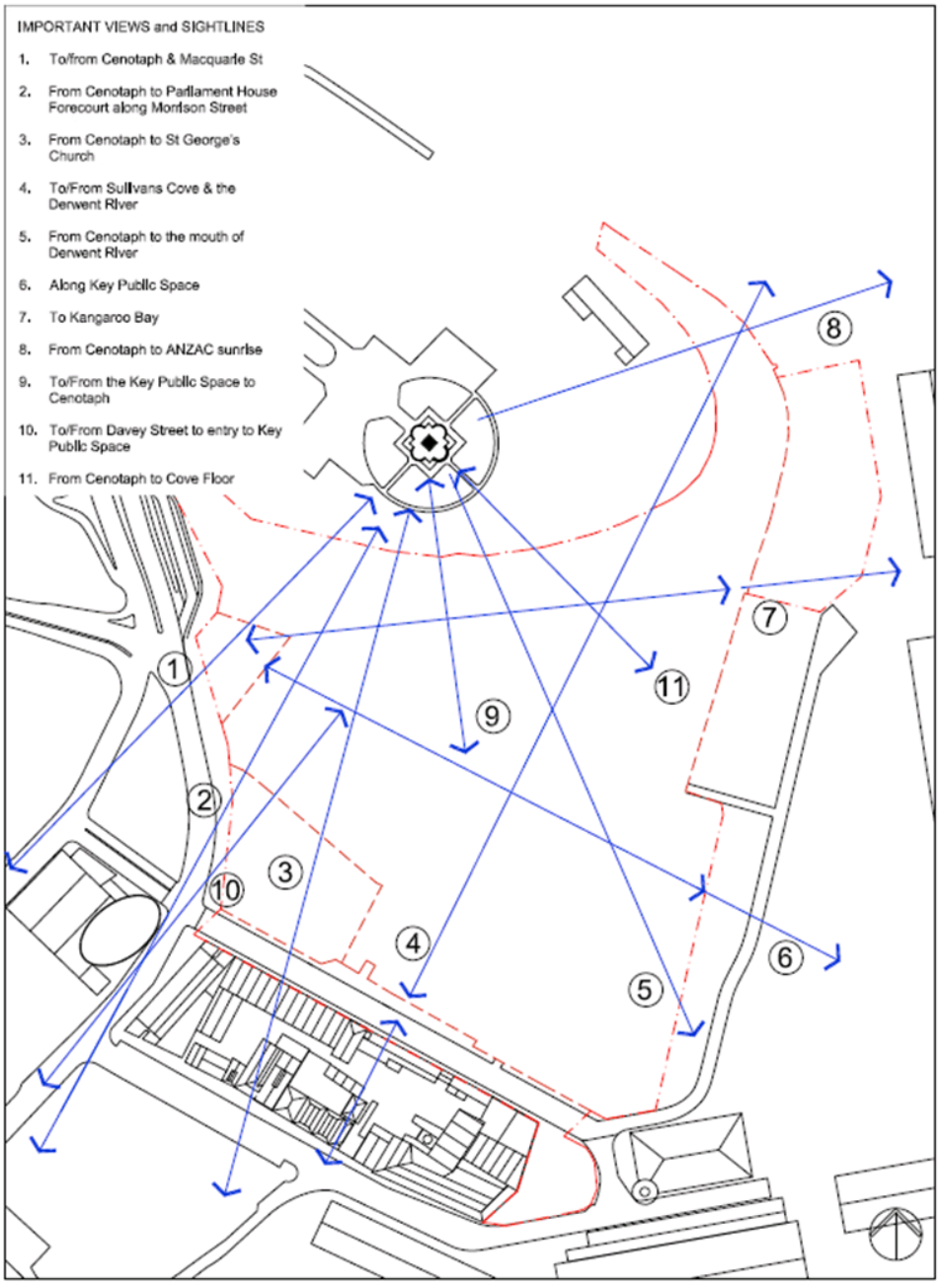
Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 One of the following applies: (a) sensitive uses are sited no closer than 400 metres from the boundary of the land contained within the title references CT16130/1, CT15736/1, CT19468/1, CT241367/1, CT241366/1 and CT1646/1 on which the Macquarie Point Wastewater Treatment Plant is situated; or (b) sensitive use must not commence until the Macquarie Point Wastewater Treatment Plant has been decommissioned (including the demolition and removal of the infrastructure, sewage and sewage bi-products, liquid wastes and chemicals).	P1 Sensitive uses must not result in potential to be unreasonably impacted by environmental harm from the Macquarie Point Wastewater Treatment Plant having regard to: (a) the nature of the use with the potential to cause environmental harm including: (i) operational characteristics; (ii) scale and intensity; and (iii) degree of hazard or pollution that may be emitted from the activity; (b) the nature of the sensitive use; (c) the extent of encroachment by the sensitive use to the Macquarie Point Wastewater Treatment Plant; (d) measures in the design, layout and construction of the development for the sensitive use to eliminate, mitigate or manage effects of emissions; and (e) any advice from the Director, Environment Protection Authority.

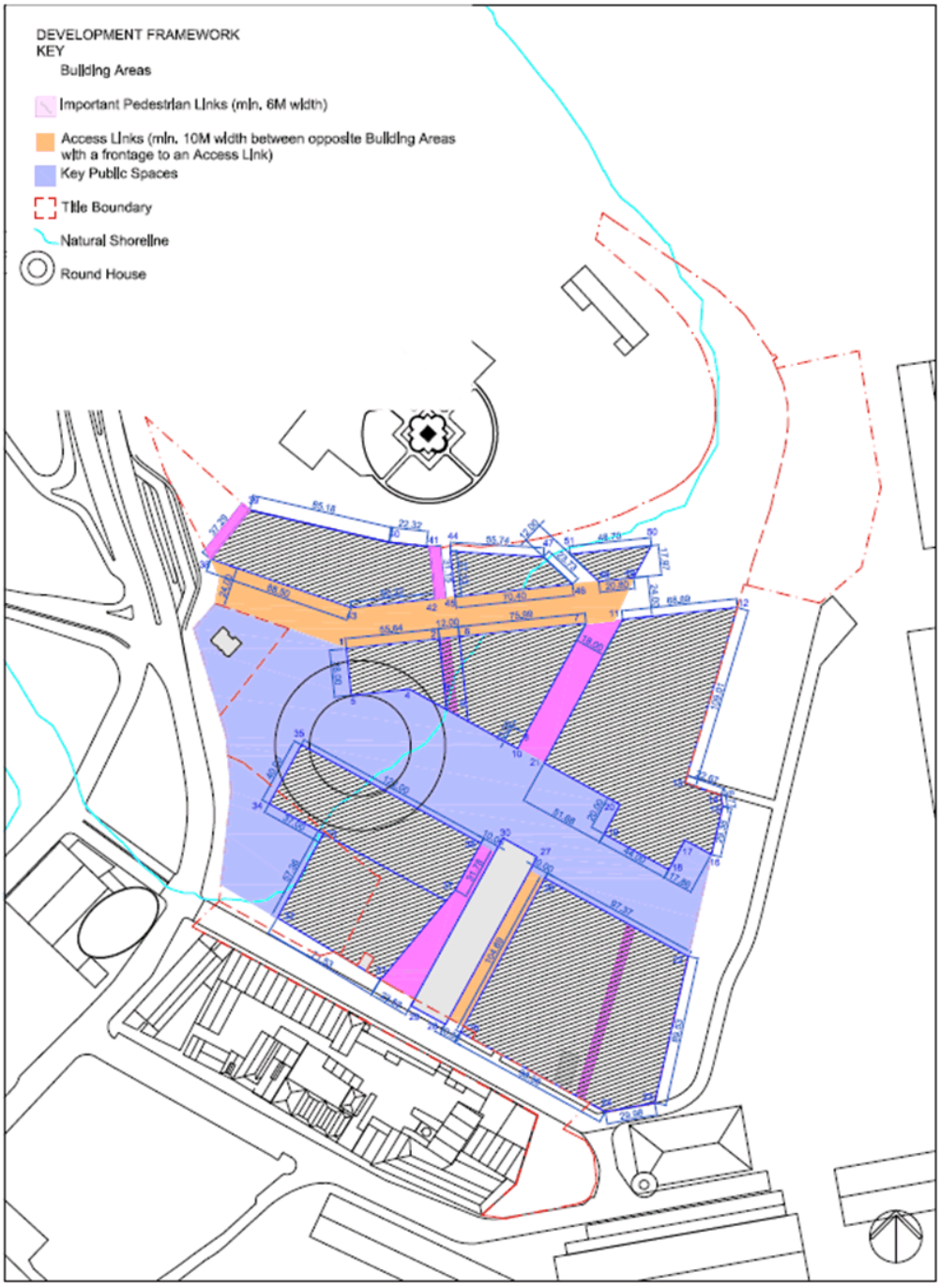
32.15 Telecommunications Infrastructure

The Telecommunications Infrastructure provisions of Schedule 9 of the Scheme apply.



MACQUARIE POINT SITE DEVELOPMENT PLAN
FIGURE 32.1 – USE AREAS


IMPORTANT VIEWS and SIGHTLINES
1. To/from Cenotaph & Macquarie St
2. From Cenotaph to Parliament House Forecourt along Morrison Street
3. From Cenotaph to St George's Church
4. To/From Sullivans Cove & the Derwent River
5. From Cenotaph to the mouth of Derwent River
6. Along Key Public Space
7. To Kangaroo Bay
8. From Cenotaph to ANZAC sunrise
9. To/From the Key Public Space to Cenotaph
10. To/From Davey Street to entry to Key Public Space
11. From Cenotaph to Cove Floor
0 10 20 40 60 80
METERS
MACQUARIE POINT SITE DEVELOPMENT PLAN
20/12/2018



MACQUARIE POINT SITE DEVELOPMENT PLAN
FIGURE 32.3 – DEVELOPMENT FRAMEWORK PLAN 1:2000 @ A3

20/12/2018

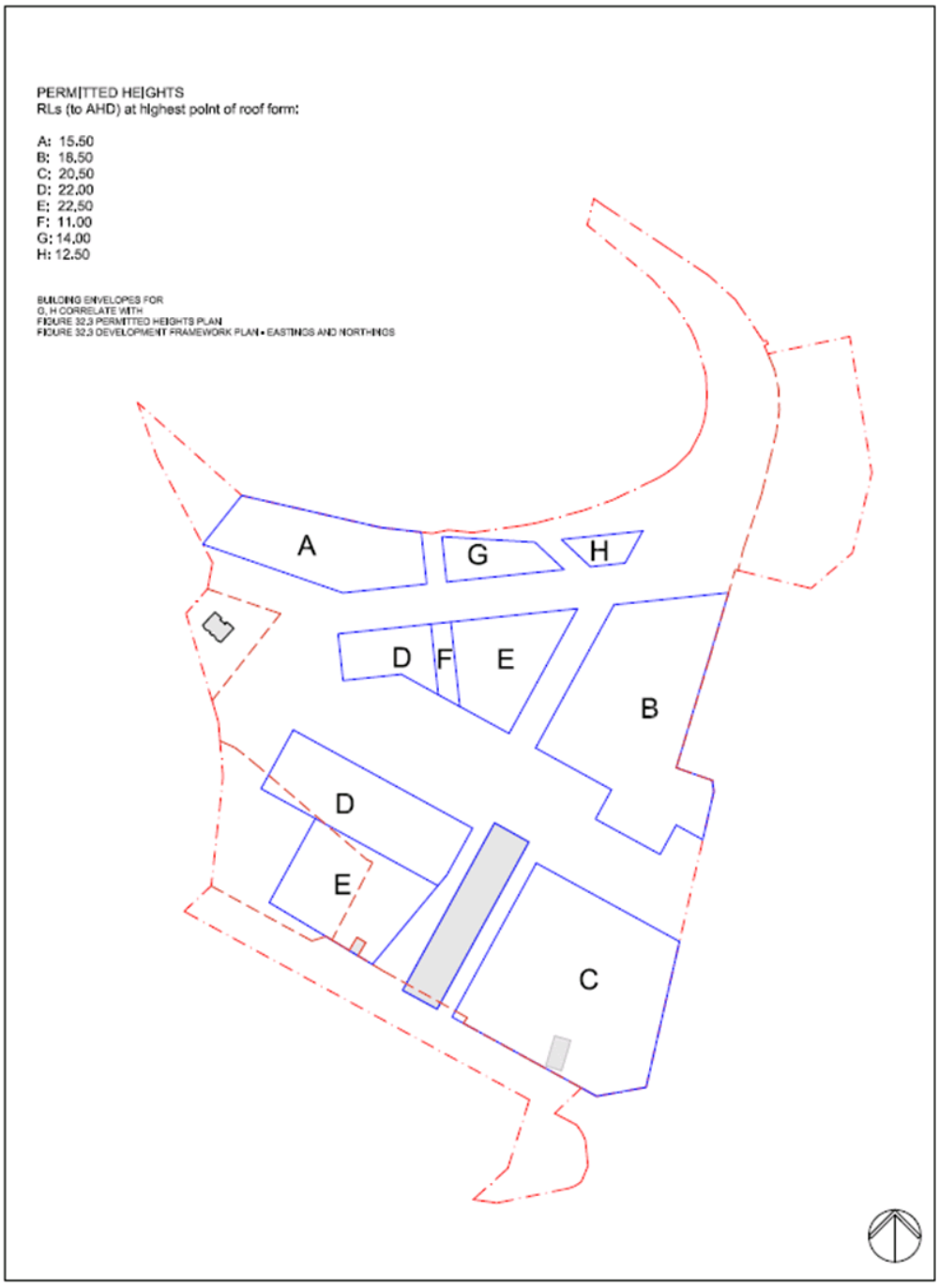
Table 32.3

EASTINGS & NORTHINGS
TABLE

POINT	EAST	NORTH	POINT	EAST	NORTH
1	527418.41	5252566.16	47	527561.60	5252608.47
2	527490.76	5252575.53	48	527591.97	5252610.31
3	527493.70	5252547.68	49	527629.26	5252669.93
4	527474.54	5252545.66	50	527625.75	5252667.58
5	527426.19	5252539.51	51	527624.99	5252665.17
6	527505.68	5252577.10	52	527617.75	5252659.06
7	527577.35	5252584.66	53	527594.13	5252646.90
8	527541.99	5252570.12	54	527563.49	5252636.84
9	527509.83	5252537.73	55	527563.91	5252636.89
10	527537.19	5252511.35	56	527524.09	5252633.12
11	527601.55	5252587.21	57	527545.73	5252634.25
12	527669.86	5252594.40	58	527595.88	5252632.86
13	527638.70	5252489.93	59	527517.02	5252630.21
14	527603.09	5252482.42	60	527502.71	5252631.83
15	527661.07	5252475.80			
16	527654.49	5252447.09			
17	527638.63	5252456.77			
18	527629.09	5252438.23			
19	527590.44	5252459.37			
20	527600.05	5252476.91			
21	527554.73	5252501.74			
22	527640.57	5252386.31			
23	527620.65	5252299.32			
24	527581.14	5252294.00			
25	527504.88	5252341.26			
26	527555.17	5252433.08			
27	527550.67	5252445.67			
28	527496.00	5252345.98			
29	527475.43	5252357.13			
30	527530.25	5252457.10			
31	527457.21	5252372.73			
32	527395.78	5252409.38			
33	527459.41	5252374.60			
33	527423.36	5252459.66			
34	527390.92	5252477.45			
35	527410.15	5252512.52			
36	527517.15	5252453.91			
37	527501.80	5252426.08			
38	527356.16	5252623.22			
39	527379.43	5252652.37			
40	527462.44	5252633.24			
41	527484.62	5252630.74			
42	527488.11	5252599.38			
43	527439.74	5252594.26			
44	527501.99	5252626.88			
45	527482.25	5252601.26			
46	527530.80	5252603.00			

MACQUARIE POINT SITE DEVELOPMENT PLAN
FIGURE 32.3 – DEVELOPMENT FRAMEWORK PLAN 1:2000 @ A3

13/11/2018



MACQUARIE POINT SITE DEVELOPMENT PLAN
FIGURE 32.4 – PERMITTED HEIGHTS 1:2000 @ A3

20/12/2018

32.0 Macquarie Point Site Development Plan

32.1 Purpose of the Site Development Plan

32.1.1 To implement the Macquarie Point ~~*Strategic Framework and*~~Reset Masterplan ~~*2015*~~2017-2030.

32.1.2 To ensure that Macquarie Point is redeveloped:

(a) as a vibrant and active area, with a mix of uses, that connects with and complements adjacent areas within Hobart;
(b) to encourage inner city living;
(c) to deliver sustainable social and economic benefits to Hobart;
(d) in accordance with sound planning, urban design and environmental principles; and
(e) to protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy.

32.2 Application of the Site Development Plan

32.2.1 Planning Area

This Site Development Plan applies to the area of land designated as 'Macquarie Point Site Development Plan' on Figure 4 of this Scheme.

32.2.2 Control of Use and Development

Subject to the other relevant requirements of this Scheme, the Planning Authority is bound to grant a permit for applications for 'use' and 'development' designated as 'permitted' in all of the relevant provisions of this Site Development Plan, but may impose conditions.
The Planning Authority has a discretion to refuse or permit applications for 'use' and 'development' designated as 'discretionary' in any of the relevant provisions of this Site Development Plan and may impose conditions.
All other 'uses' and 'development' are 'prohibited'.

32.2.3 Exempt Development

The following development is exempt from requiring a permit:

(a) Works associated with the investigation of land contamination;
(b) Public art;
(c) Maintenance and repair by or on behalf of the State Government, a Council, a statutory authority, or a corporation all the shares of which are held by or on behalf of the State or by a statutory authority, of:
    i. Electricity, gas, sewerage, stormwater and water reticulation to individual streets, lots or buildings;
    ii. Infrastructure such as roads, rail lines, footpaths, cycle paths, drains, sewers, power lines and pipelines; and
    iii. Minor infrastructure such as footpaths and cycle paths, playground equipment, seating and shelters, telephone booths, post boxes, bike racks, fire hydrants, drinking fountains, rubbish bins, public art, traffic control devices and markings, and the like on public land.

32.2.4 Land decontamination

The undertaking of works to remediate land are permitted.

32.2.5 Definitions

Activity Centre Network	Means the Activity Centre Network in Table 1 of the *Southern Tasmania Regional Land Use Strategy 2010 - 2035*.

Cove Floor	The reclaimed areas of Macquarie Point ~~shown as all areas other than~~to the ~~Escarpment Park~~east of the
Environmental Audit	Means a report prepared by a Suitably Qualified Person (Site Contamination) on the nature, extent and levels of existing contamination and the actual or potential risk to human health or the environment, on or off the site, resulting from that contamination, prepared in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended 16
Environmental Harm	Means 'environmental harm' as described in section 5 of the *Environmental Management and Pollution Control Act 1994* and includes an environmental nuisance.
Environmental Nuisance	Means an 'environmental nuisance' as described in section 3 of the *Environmental Management and Pollution Control Act 1994*
Height	For development inside the areas shown on Figure 32.4 means the uppermost part of a building excluding minor protrusions such as aerials, antennae, solar panels, chimneys and vents measured in Australian Height Datum (AHD). For development outside the areas shown on Figure 32.4, the vertical distance from existing ground level at any point to the uppermost part of a building directly above that point, excluding minor protrusions such as aerials, antennae, solar panels, chimneys and vents.
Primary Space	Key Public Spaces~~, Escarpment Park, Water to Water Promenade and Access Links~~ shown on Figure 32.3, and
Secondary Space	Smaller roads, lanes, alleys and ad hoc courts shown as Important Pedestrian Links shown on Figure 32.3.
Sensitive Use	Means a residential use or a use involving the presence of people for extended periods of time, except in the course of their employment, such as a caravan park, childcare centre, dwelling, hospital or school.
Site-Specific Report	Means an environmental impact assessment carried out by a Suitably Qualified Person (Emissions), which meets the technical components of section 74 of the *Environmental Management and Pollution Control Act 1994* and includes the impact of building design, layout and construction of the development to eliminate, mitigate or manage effects of emissions to ensure that a proposed use will not be unreasonably impacted by environmental harm caused by the operations of the Macquarie Point Wastewater Treatment Plant.
Suitably Qualified Person (Emissions)	Means a person who, in the opinion of the planning authority, can demonstrate that a proposed use will not be unreasonably impacted by environmental harm caused by the operations of the Macquarie Point Wastewater Treatment Plant.

Suitably Qualified Person (Site Contamination)	Means a person appointed as an accredited environmental auditor in accordance with section 39F of the *Macquarie Point Development Corporation Act 2012*.

32.2.6 Interim Use and Development

Notwithstanding the requirements of Clauses 32.3, 32.5, 32.7.1, 32.7.2, 32.7.3, 32.7.4, 32.7.5, 32.7.6, 32.7.7, 32.7.8, 32.7.10 and 32.10, the Planning Authority has discretion to approve temporary use and development for a period not exceeding 5 years providing buildings are located and designed in a manner that does not prejudice the future development of the area or appropriate pedestrian, cycle and vehicle linkages through the site to adjacent Activity Areas.

32.3 Desired Future Character Statements

Desired Future Character Statements	Implementation Strategy

Development of Activity Area 3.0 will: 32.3.1 Re-engage with its history by revealing layers of the changing nature of Macquarie Point over time through expression of the topography, natural shoreline, Round House, Goods Shed, Royal Engineers Building and Red Shed. 32.3.2 Ensure that development respects the setting and appreciation of the cultural heritage significance of the Royal Engineers Building. 32.3.3 Ensure that development does not adversely impact on the cultural heritage and reverential ambience of the Hobart Cenotaph and its surrounds. 32.3.4 ~~Include a new~~Acknowledge the footprint of the former railway Round House ~~building~~ as shown on Figure 32.3 and the associated Table 32.3 ~~to mark the footprint of the former railway Round House and act as a landmark entry to Macquarie Point, particularly from Davey Street~~. 32.3.5 Protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy by: ~~(a)~~• Providing a buffer of non-sensitive uses in the buildings along the port interface to avoid constraints on the working port; ~~(b)~~• Ensuring that sensitive uses are separated and treated so as not to be vulnerable to noise, air, vibration and lighting impacts; ~~(c)~~• Incorporating appropriate design responses to avoid conflict between mixed-use, pedestrian and industrial vehicular traffic associated with the Port of Hobart along Evans Street; ~~(d)~~ Ensuring compliance with relevant safety and hazard	Use and Development Standards and clause 32.4.

distances as specified in relevant Australian standards; and

~~(e)~~ Preserving the opportunity for a future connection to the Port of Hobart from the north via the Regatta Grounds.

32.3.6 Provide for recreation and associated uses in designated open spaces as shown on Figure 32.3 and the associated Table 32.3.

32.3.7 Ensure that the bulk, siting and height of buildings are sympathetic to the natural topography of the headland, amphitheatre, and escarpment surrounding the Cenotaph and reinforce the natural shoreline with freestanding buildings viewed in the round on the Cove Floor.

32.3.8 Not unreasonably impact on important views, including the following shown on Figure 32.2:

~~(f)~~ From the Cenotaph toward the mouth of the Derwent River, including the flat river plane that extends to the horizon;

~~(g)~~ From the Cenotaph to the horizon of the natural amphitheatre, including the Wellington Range descending to the Mount Nelson ridge, then to Porter Hill and down to the water plane at Long Point, Lower Sandy Bay;

~~(h)~~ From the Cenotaph to St George's Church;

~~(i)~~ From the Cenotaph to the Parliament House forecourt along Morrison Street;

~~(j)~~ The views across the Cove toward the Cenotaph, including from Macquarie Street, the forecourt of the Princes Wharf No. 1 Shed; the Paddock between Princes Wharf No. 1 Shed and the Institute for Marine and

Antarctic Studies (IMAS), Runnymede Street and the open space at the eastern end of the IMAS building.~~;~~ • The view of the sunrise from the grounds of the Cenotaph on Anzac Day; ~~(k)~~• To and from Sullivans Cove and the Derwent River aligning NE/SW; • From the Royal Engineers Building to Kangaroo Bay; ~~(l)~~• Along the ~~Water to Water Promenade.~~ Key Public Space; and • ~~32.3.9~~ To and from the Key Public Space and Cove Floor to the Cenotaph. 32.3.9 To and from Davey Street and the entry to the Key Public Space. Ensure that the design and appearance of roofs provide interest when viewed from the elevated areas of the Cenotaph and Domain through measures that may include incorporation of, rooftop gardens or articulated roof forms that ~~reference the industrial saw tooth or~~ serve a purpose such as daylighting of internal areas. 32.3.10 Establish and reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site. 32.3.11 Include a network of connections through and around the site as shown on Figure 32.3 and the associated Table 32.3, including a series of: ~~(m)~~• Primary shared street spaces extending north from Evans Street and east from Tasman Highway towards the centre of the site; and	

• Smaller and more intimate secondary spaces that ~~run east-west and~~ provide permeability across the site. Their position can be adjusted to suit the preferred building form, siting and lot size/s. •32.3.12 Include a direct pedestrian link between the Key Public Space and Cenotaph that traverses the escarpment.	

32.4 Matters to be Considered

In considering applications and any conditions to be imposed on 'use' and 'development', the Planning Authority must consider:-

- The Desired Future Character Statements in clause 32.3;
- The preferred treatment of robust, self-pigmented external materials and finishes to primary and secondary spaces;
- The suitability of proposed development to achieve satisfactory levels of safety and amenity of occupants including the avoidance of vulnerability to noise, air, vibration and lighting impacts from the Port of Hobart;-
- The potential for land use conflict between the proposed use and development and the use of Macquarie Point for major public events;
- The impact on the operation of the Port of Hobart;
- The height of buildings within Activity Area 3.0, and on adjoining and adjacent lots;
- The bulk and form of existing and proposed buildings;
- The spatial characteristics of the streets and spaces and the quality of the environment;
- Protection of water quality and water sensitive urban design principles;
- Protection of public infrastructure and the environment;
- Impacts from land decontamination works, and the need for uses not to commence until relevant areas of the site have been appropriately remediated;
- The quality of the architectural design;
- The adequacy and capacity of existing infrastructure and services including roads, footpaths, water, sewerage and power to cater for the proposed development; and
- The ~~key drivers outlined~~Strategic Principles in ~~Section 3 and principles outlined in Section 12: *From Shared Vision to Masterplan in New Territory from Old Ground:*~~Appendix A of the Macquarie Point ~~*Strategic Framework and*~~Reset Masterplan ~~*2015*~~2017-2030.-

32.5 Use Table

The 'Macquarie Point Site Development Plan' area is divided into three use area types as shown on Figure 32.1.

32.5.1 Uses within Use Area 1: ~~Commercial~~Arts and Institutional Area

Use Class	Condition
Exempt	
Occasional sporting, social and cultural events	
Passive Recreation	
Permitted	
Art and Craft Centre	
Arts and Cultural Centre	
Car Park	Except if on ground floor level and within 8 metres of the front of a building that faces a primary or secondary space.
Community Centre	
Eating Establishment	
Education Centre	Except for secondary or primary school
Exhibition Centre	
Function Centre	
Market	
Minor Sport and Recreation	
Office	
Public Display Office	
Public Transport Facility	
Research and Development Centre	
Shop	
Utility Installation	
Discretionary	
~~Gambling Premises~~Commercial Port	
~~Hospital Services~~	
Hotel	Except for accommodation
Light Industry	
Major Sport and Recreation	

Manufacturing Sales	
Place of Worship	
~~Passive Recreation~~	
Railway Terminal	
~~Recreational Boating Facility~~Service	
Transport Terminal	
Warehouse	
Prohibited	
All other uses	

32.5.2 Uses within Use Area 2: Mixed Use Area

Use Class	Condition
Exempt	
Occasional sporting, social and cultural events	
Passive Recreation	
Permitted	
Art and Craft Centre	
Arts and Cultural Centre	
Car Park	Except if not adjacent to the escarpment and on ground floor level and within 8 metres of the front of a building that faces a primary or secondary space.
Child Care Centre	
Community Centre	
Eating Establishment	
Education Centre	
Exhibition Centre	
Function Centre	
Hospital Services	
Hotel	Only if above ground floor level where fronting Evans Street.
Market	
Manufacturing Sales	Only if in the Goods Shed
Minor Sports and Recreation	

Office	
~~Passive Recreation~~	
Place of Worship	
Public Display Office	
Public Transport ~~Terminal~~ Facility	
Railway Terminal	
Research and Development Centre	
Residential Accommodation	~~Except~~Only if in Areas 2.1 and 2.2 on Figure 32.1 and above ground floor level ~~and within 8 metres of the front of a~~
Shop	
Utility Installation	
Visitor Accommodation	Except if on ground floor level and within 8 metres of the front of a building that faces a primary or secondary space.
Discretionary	
~~Child Care Centre~~Light Industry	
~~Gambling Premises~~	
Major Sport and Recreation	
Manufacturing Sales	
~~Minor Sports and Recreation~~	
~~Recreational Boating Facility~~	
Transport Terminal	
Warehouse	
Prohibited	
All other uses	

32.5.3 **Uses within Use Area 3: Open Space Area**

Use Class	Condition
Exempt	
~~Passive Recreation~~	
Occasional sporting, social and cultural events	
Passive Recreation	
Permitted	

Car Park	Only in the ~~Escarpment Park,~~ Art School car park (47 Hunter Street) or associated with the use of the Royal Engineers Building.
Community Centre	
Market	
Office	Only in the Royal Engineers Building.
Public Transport Facility	
Discretionary	
Art and Craft Centre	
Arts and Cultural Centre-	
Car Park	Only if underground
Child Care Centre	
Eating Establishment	
Minor Sports and Recreation	
Railway Terminal	~~Only in the Escarpment Park.~~
Recreational Boating Facility	
Research and Development Centre	Only if directly associated with a use n the Arts and Institutional Area.
Shop	
Transport Terminal	
Utility Installation	
Prohibited	
All other uses	

32.6 Use Standards

32.6.1 Mixed Use

Objective:	To ensure that Activity Area 3.0 is developed with a mix of uses.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 The total combined floor area of the following uses does not exceed: (a) Shop: 10,000 m² (b) Research and Development Centre and Education Centre: ~~15~~35,000 m² (c) Office: ~~60~~30,000 m² (d) Residential Accommodation: ~~50,000 m²~~15,000m² (e) Hotel and Visitor Accommodation: 20,000 m²	P1 Uses must contribute to the interest and activity of Macquarie Point as a mixed use area having regard to the following: (a) Provide for a diversity of uses at densities responsive to the character of streetscapes and public spaces; (b) Encourage use at street level that generates activity and pedestrian movement through the area; (c) Ensure that shop and office uses are consistent with the Activity Centre Network and do not have an unacceptable impact on the Hobart CBD.

32.6.2 Residential and Visitor Accommodation Uses ~~Fronting Evans Street~~

Objective:	(a) Ensure appropriate levels of safety and amenity for residential and visitor accommodation ~~developments directly fronting Evans Street; and~~; (b) Protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy~~.~~; and ~~(b)~~(c) Protect the viability of Macquarie Point as a major public event space

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Residential or Visitor Accommodation development ~~within 50 metres of Evans Street~~ must demonstrate that design elements are able to achieve internal noise levels in accordance with relevant Australian Standards for acoustics control (including AS3671:1989 – *Road Traffic Noise Intrusion (Building Siting and Construction)* and AS2107:2000 – *Acoustics (Recommended Design Sound Levels and Reverberation Times for Building Interiors)*).	P1 Residential or Visitor Accommodation development is adequately protected from environmental harm from noise from transport~~/~~ movements, the operational port ~~noise to safeguard occupants' health~~ and ~~amenity~~likely noise from major public events at Macquarie Point.

32.6.3 Car Parking

Objective:	To ensure that traffic movements associated with car parking use can be accommodated safely within the surrounding road network.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 The total number of car parking spaces in Activity Area 3.0, excluding Area A shown on Figure 32.4, must not exceed 350 spaces.	P1- Traffic impacts associated with car parking must be safe and minimise any adverse impact on the efficiency of the road, having regard to: (a) The increase in traffic caused by the car parking; (b) The nature of the traffic generated by the car parking; (c) The surrounding road conditions; (d) The need for the use; (e) Any traffic impact assessment; and (f) Any proposed engineering works or traffic management arrangements.

32.7 Development Standards for Buildings or Works

32.7.1 Impacts from the Working Port

Objective:-	(a) Ensure appropriate levels of safety and amenity for occupants of buildings; and (b) Protect the operation of the Port of Hobart for the benefit of the local, regional, state and national economy.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**

A1	P1
Buildings: (a) Within 50 metres of the boundary adjoining the Port of Hobart must include design elements that are able to achieve internal noise levels in accordance with the relevant Australian Standards for acoustics control (including AS3671:1989 – *Road Traffic Noise Intrusion (Building Siting and Construction)*, and AS2107:2000 – *Acoustics (Recommended Design Sound Levels and Reverberation Times for Building Interiors)*); (b) Within 20 metres of the boundary adjoining the Port of Hobart must not have private outdoor areas, decks or balconies; and (c) Within 10 metres of the boundary adjoining the Port of Hobart must only have fixed windows (non-opening).	Buildings are adequately protected from noise arising from port activities including the movement of heavy vehicles to safeguard occupants' health and amenity.

32.7.2 Building Form

Objective:	Ensure the height and form of buildings are: (a) Consistent with established building forms within Sullivans Cove; (b) Sympathetic to the natural topography of Sullivans Cove, including the amphitheatre sloping down to the Cove with the headland and escarpment surrounding the Cenotaph forming a natural expression of the Cove Wall; (c) Respectful of the low-lying nature of the site and its visibility from surrounding elevated areas.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**

A1-	P1
Building height must be no more than:- (a) The permitted heights for areas shown in Figure 32.4 and associated Table 32.3; or (b) 6 metres if outside the areas shown on Figure 32.4. and associated Table 32.3	Building height is consistent with the streetscape, urban form and character of the surrounding area, having regard to: (a) The Desired Future Character Statements in clause 32.3; (b) The protection of important views shown in Figure 32.2; (c) The apparent height when viewed from the Cenotaph and the southern side of the Cove; (d) The overshadowing of existing and proposed buildings and of the Key Public Spaces as shown in Figure 32.3 and the associated Table 32.3; (e) The individual prominence of the building and its contrast with neighbouring buildings; (f) The architectural and design merit of the building itself; (g) The contribution the building will make to Macquarie Point and the City of Hobart more generally in terms of architectural character and quality; (h) The extent and nature of the contribution that the building and its use will make to the economic activity of Macquarie Point and in the City of Hobart; (i) The extent and nature of the contribution that the building and its use will make to the reputation of the City of Hobart as an international destination; and (j) The civic amenity of the building. Buildings sited adjacent to the headland are not to protrude above the escarpment when viewed from the Cenotaph. ~~(i)~~

A2 Except for the Round House, roofs must incorporate pitched elements, such as gables, skillions and saw tooths, that: (a) Have a pitch of at least 15 degrees; and (b) Extend across a minimum of 50 per cent of the building' s roof area.	P2 Roof form: (a) Contributes to the articulation of building form; (b) Contributes to the integration of new buildings into the surrounding area; and (c) Provides architectural interest when viewed from elevated areas.
A3 Building footprint must be consistent with the areas shown in Figure 32.3 and the associated Table 32.3.	P3 Building form minimises apparent size and bulk having regard to: (a) The Desired Future Character Statements in clause 32.3; (b) The facilitation of secondary spaces; (c)(a) The visual prominence of the building when viewed from public spaces; and (d) The use of design measures such as vertical articulation.

A2 There is no Deemed to Comply standard for roof form for buildings with a floor area greater than 300m^2.	P2 Roof form: (a) Contributes to ~~To ensure that~~ the ~~alignment~~articulation of building form; (b) Contributes to the integration of new buildings ~~on the Cove Floor provide strong continuous walls to form roads~~into the surrounding
A3 Buildings ~~located~~are sited within the ~~Cove Floor with frontage to a primary space or secondary space must:~~ ~~(a) Be built to the edge of that space as~~areas shown ~~on~~in Figure 32.3 and the associated Table 32.3~~; and~~ ~~(b) Extend (in elevation) the full width of the lot except where providing for the creation of a new secondary space~~.	P3 Building form minimises apparent size and bulk having regard to: (a) The Desired Future Character Statements in clause 32.3; (b) The facilitation of secondary spaces; (c) The visual prominence of the building when viewed from public spaces; and The use of design measures such as vertical articulation.~~P1~~ ~~(a) Where fronting onto a primary space, the alignment of buildings must~~

32.7.3 Building Alignment ~~– Cove Floor~~

Objective:	To ensure that the alignment of buildings forms roads and other public spaces.~~Establish and reinforce a well-defined built edge to Evans Street,~~
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 ~~Building setback from Evans Street must be 3 metres.~~Buildings located within the Building Areas on Figure 32.3 and within 20m of a frontage to a primary or secondary space are to align the edge of that space for a minimum of 70% of the width of the building facing that frontage.	P1 ~~Building setback~~Buildings must: ~~(a) Be compatible with the setback of adjoining buildings and the streetscape;~~ (a) ~~(b) Only~~ be sited ~~closer~~and aligned having regard to ~~Evans Street where it can be demonstrated that it is sufficiently setback from~~the Desired Future Character Statements in clause 32.3 and the intended spaces shown on Figure 32.3 and associated Table 32.3; and

~~32.7.5~~

32.7.4 Building Alignment ~~– Escarpment Park~~to Evans Street

Objective:	Establish and reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site.~~To ensure~~

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 ~~Areas A and F shown on Figure 32.4.~~Building setback from Evans Street must be 3 metres.	P1 ~~Buildings~~Building setback must: (a) Be compatible with the setback of adjoining buildings and the streetscape; (b) Only be sited ~~and aligned having regard~~closer to ~~the Desired Future Character Statements~~Evans Street where it can be demonstrated that it is sufficiently setback from the alignment of the Goods Shed to highlight that building within the streetscape; and (c) Only provide variations in ~~clause 32.3~~building alignment to break up

~~32.7.6~~

32.7.5 Building Alignment – Adjacent to the escarpment (Use Area 2 adjacent to the escarpment on Figure 32.1)

~~**32.7.4** Design~~

Objective:	~~To ensure that building façades promote and maintain high levels of pedestrian interaction, amenity and safety.~~To ensure that the siting and alignment of buildings adjacent to the escarpment are sympathetic to the natural topography of the headland, amphitheatre and escarpment

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Buildings adjacent to the escarpment are sited in Area A shown on Figure 32.4.	P1 Buildings must be sited and aligned having regard to the Desired Future Character Statements in clause 32.3.

32.7.6 Design

Objective:	To ensure that building façades promote and maintain high levels of pedestrian interest, amenity and safety.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Buildings must comply with the following: (a) Provide the main pedestrian access to the building so that it is visible from the road or publicly accessible areas of the site; (b) Ground floor façades facing a primary or secondary space must comprise a surface area of no less than 40 per cent consisting of windows or doorways; and (c) Ground floor facades facing a primary or secondary space must not comprise a single length of blank wall greater than 30 per cent of the total façade on that frontage.	P1 Buildings must be designed to enhance the streetscape by: (a) Providing a pedestrian access to the building that addresses the street or other public place; (b) Providing ~~windows in the front façade in a way that enhances the streetscape and provides~~ for passive surveillance of public spaces; and (c) Treating large expanses of blank wall in the front façade and façades facing other public space boundaries with architectural detail or public art so as to contribute positively to the
A2 Mechanical plant and other service infrastructure, such as heat pumps, air conditioning units, switchboards, hot water units and the like, must not be visible from the street and other public places.	P2 Mechanical plant and other service infrastructure, such as heat pumps, air conditioning units, switchboards, hot water units and the like, when viewed from the street or other public places, must not detract from: (a) The visual qualities of the streetscape; and (b) The amenity of pedestrians through noise, air movement, dust or similar.
A3 Security shutters or grilles must not be fitted over windows or doors on façades facing a primary or secondary space or other public place.	P3 Security shutters or grilles over windows or doors on a façade facing the frontage or other public spaces are only provided if it is essential for the security of the premises and no other alternatives are feasible.

32.7.7 Roof Mounted Mechanical Plant

Objective:	Rooftop mechanical plant is to be unobtrusive when viewed from elevated areas including the Cenotaph and surrounding areas.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Buildings are to achieve one or more of the following: (a) Roof-top mechanical plant and service infrastructure, including lift structures, must be contained within the roof;- (b) Roof-top mechanical plant is to be screened from public view including from the Cenotaph and surrounding areas.	P1 Rooftop mechanical plant is to be sited and treated so as to be unobtrusive when viewed from the Cenotaph and surrounding areas.

32.7.8 Outdoor Storage Areas

Objective:-	To ensure outdoor storage areas do not visually detract from the area.

Deemed to Comply (Permitted)	Performance Criteria (Discretionary)
A1 Outdoor storage areas must: (a) Be located behind the façade of the building; and (b) All goods and materials stored must be screened from public view.	P1- Outdoor storage areas must be located, treated or screened to minimise adverse impacts on the visual amenity of the area.

32.7.9 Inundation Hazard

Objective:-	To ensure the risk from coastal inundation is appropriately managed.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 The finished floor level of a habitable room must be not less than 2.8 metres above the Australian Height Datum (AHD).	P1 No performance criteria.

32.7.10 Pedestrian Links

Objective:	-To provide a network of pedestrian connections.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
A1 A minimum 6 metres wide publicly accessible ~~east west~~ pedestrian lane or arcade is provided within 10 metres of a pedestrian link shown on Figure 32.3 and the associated Table 32.3.	P1 Buildings must compliment a network of pedestrian connections having regard to: (a) The Desired Future Character Statements in clause 32.3; and (b) The ~~key drivers outlined~~Strategic Principles in ~~Section 3 and principles outlined in Section 12: *From Shared Vision to Masterplan*~~

32.8 Development Standards for Subdivision

32.8.1 Subdivision

Objective:	To ensure that subdivision of land is consistent with achieving the desired layout of buildings and spaces and occurs in a coordinated manner with its use and development.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**

A1 Each lot must: (a) Have an area, dimensions and layout consistent with the building areas within the Macquarie Point Development Framework Plan as shown in Figure 32.3 and the associated Table 32.3; (b) Be required for public use by the State Government, a Council, a statutory authority, or a corporation all the shares of which are held by or on behalf of the State, Council or by a statutory authority; or (c) Be required for the provision of Utilities.	P1 ~~(a)~~ (a) Subdivision of land is for the purposes of facilitating the desired use and development of land having regard to the layout of buildings and spaces outlined in the Macquarie Point Development Framework Plan as shown in Figure 32.3 and the associated Table 32.3 and forms part of an application for that use and development; or ~~(b)~~ (b) Subdivision of land ensures that each lot: ~~i.~~ i. has a sufficient area, dimensions and frontage to public space for its intended use; ~~ii.~~ ii. provides for sufficient spaces and connection through the site; and ~~iii.~~ iii. facilitates the articulation of building form by minimising building bulk; and ~~iv.~~ iv. does not frustrate the opportunity for a future alternative access to the Port of Hobart via the Regatta Grounds from the north: having regard to the desired layout of building and spaces shown in Figure 32.3 and the associated Table 32.3, the location of existing and approved buildings and the Desired Future
~~A2~~ ~~Each lot must have a frontage, or legal connection to a road by a right of carriageway, of not less than 3.6 metres.~~	~~P2~~ ~~Each lot, must be provided with a frontage or legal connection to a road by a right of carriageway, that is sufficient for the intended use, having regard to:~~ ~~(a) The number of other lots which have the land subject to the right of carriageway as their sole or principal means of access;~~

	(b) The functionality and usability of the frontage or access; (c) Existing or intended adjoining public space through which occasional vehicular access may be granted; (d) The anticipated nature of vehicles likely to access the site; (e) The ability to manoeuvre vehicles on the site; (f) The ability for emergency services to access the site; and The advice of the road authority.
A3 Each lot, excluding for public open space or utilities, must be capable of a connection to: (a) A reticulated potable water supply; (b) A reticulated sewerage system; and A public stormwater system able to service the building area by gravity.	P3 No performance criteria.

A2 Each lot must have a frontage, or legal connection to a road by a right of carriageway, of not less than 3.6 metres.	P2 Each lot, must be provided with a frontage or legal connection to a road by a right of carriageway, that is sufficient for the intended use, having regard to: (a) The number of other lots which have the land subject to the right of carriageway as their sole or principal means of access; (b) The functionality and usability of the frontage or access; (c) Existing or intended adjoining public space through which occasional vehicular access may be granted; (d) The anticipated nature of vehicles likely to access the site; (e) The ability to manoeuvre vehicles on the site; (f) The ability for emergency services to access the site; and
A3 Each lot, excluding for public open space or utilities, must be capable of a connection to: (a) A reticulated potable water supply; (b) A reticulated sewerage system; and A public stormwater system able to service the building area by gravity.	P3 No performance criteria.

32.9 Heritage

The heritage provisions of Schedule 1 of the Scheme apply.

32.10 Public Urban Space

32.10.1 Prior to development within the Primary Spaces or Secondary Spaces, a planning permit is required for a civic works concept plan. The plan is to show the extent of intended civic works, including provision of essential services infrastructure, public amenities, paving, planting, location of all fixed street furniture, including trees and ground covers, artworks, free standing signs, lights and lighting concept. It is to be prepared having regard to the

Desired Future Character Statements in clause 32.3 and Matters to be Considered in clause 32.4.

32.10.2 A permit is not required for development in accordance with an approved civic works concept plan.

32.11 Signage

The Signage provisions of Schedule 4 of the Scheme apply.

32.12 Traffic, Access and Parking

The Traffic, Access and Parking provisions of clause 32.6.3 and Schedule 5 of the Scheme apply. The provisions of clause 32.6.3 prevail over Schedule 5 of the Scheme to the extent of any inconsistency.

32.13 Demolition

The Demolition provisions of Schedule 7 of the Scheme apply.

32.14 Environmental Management

32.14.1 If an accredited environmental auditor has provided a certification in accordance with section 39F(1) of the *Macquarie Point Development Corporation Act 2012*, then the land contamination objectives of Schedule 8 – Environmental Management, do not apply to any use or development which is the redevelopment referred to in such certificate.

32.14.2 In determining the grant of a permit for any application for use and development within the 'Macquarie Point Site Development Plan', the planning authority must not impose any condition or restriction in a planning permit which is inconsistent with, or imposes any additional requirements to, a certificate from an accredited environmental auditor given pursuant to section 39F of the *Macquarie Point Development Corporation Act 2012*.

32.14.3 The planning authority may grant a planning permit for remediation of any part of the land within the 'Macquarie Point Site Development Plan' the effect of which is conditional upon the grant of a certificate by an accredited environmental auditor pursuant to section 39F of the *Macquarie Point Development Corporation Act 2012* and may do so in anticipation of the grant of such certificate.

32.14.4 Where an accredited environmental auditor has granted a certificate in accordance with section 39F of the *Macquarie Point Development Corporation Act 2012* in relation to a proposed development or use, then the provisions of Schedule 8 – Environmental Management, do not apply in relation to the remediation of the land the subject of the certificate.

32.14.5 Subject to the above clauses, Schedule 8 – Environmental Management, applies to the use and development of land as identified in the 'Macquarie Point Site Development Plan'.

32.14.6 Attenuation from the Macquarie Point Wastewater Treatment Plant

Objective:	To ensure that sensitive uses are separated from or do not conflict with, interfere with, or constrain the Macquarie Point Wastewater Treatment plant to mitigate any adverse effects.
Deemed to Comply (Permitted)	**Performance Criteria (Discretionary)**
~~A1~~ ~~One of the following applies:~~ ~~(a) Sensitive uses are sited no closer than 400 metres from the boundary of the land contained within the title references CT 16130/1, CT 15736/1, CT 19468/1, CT 241367/1, CT 241366/1 and CT 11646/1 on which the Macquarie Point Wastewater Treatment Plant is situated; or~~	~~P1~~ ~~No performance criteria.~~

~~(b) Sensitive use must not commence until the Macquarie Point Wastewater Treatment Plant has been decommissioned (including the demolition and removal of the infrastructure, sewage and sewage bi-products, liquid wastes and chemicals).~~	
~~A2~~ A1 One of the following applies: (a) ~~Notwithstanding the designation of a particular use as permitted or discretionary under clause 32.5, the following~~sensitive uses ~~must be~~are sited no closer than 400~~.~~ metres from the boundary of the land contained within the title references ~~CT 16130~~CT16130/1, ~~CT 15736~~CT15736/1, ~~CT 19468~~CT19468/1, ~~CT 241367~~CT241367/1, ~~CT 241366~~CT241366/1 and ~~CT 11646~~CT1646/1 on which the Macquarie Point Wastewater Treatment Plant is situated~~:~~; or ~~i. Art and Craft Centre;~~ ~~ii. Arts and Cultural Centre;~~ ~~iii. Community Centre;~~	~~P2~~ ~~Proposed~~P1 Sensitive uses must not result in potential to be unreasonably impacted by environmental harm from the Macquarie Point Wastewater Treatment Plant ~~as demonstrated in a site-specific report prepared by a Suitably Qualified Person (Emissions), having regard to all of the following~~having regard to: (a) ~~The~~the nature of the use with the potential to cause environmental harm~~,~~ including: ~~i.~~ (i) operational characteristics; ~~ii.~~ (ii) scale and intensity; and ~~iii.~~ (iii) degree of hazard or pollution that may be emitted from the activity; ~~and~~ (b) ~~The degree~~the nature of the sensitive use; ~~(b)~~(c) the extent of encroachment by the ~~proposed~~sensitive use to the

32.15 Telecommunications Infrastructure

The Telecommunications Infrastructure provisions of Schedule 9 of the Scheme apply.

AllUrbanPlanning PTY LTD

Planning Scheme Amendments to Macquarie Point Site Development Plan Planning Report

Date December 2018

19 Mawhera Ave, Sandy Bay Tasmania 7005 Call 0400 109 582
Email frazer@allurbanplanning.com.au allurbanplanning.com.au

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Executive Summary

In December 2016, Mona put forward its vision for the Macquarie Point site focusing on the development of an arts and cultural precinct and a nationally significant Truth and Reconciliation Art Park.

In recognising that Macquarie Point presents a once in a generation opportunity for Hobart and Tasmania, the Tasmanian Government directed the Corporation to reset the vision for the Macquarie Point site and prepare a new plan for development based on the MONA vision.

"The new vision addresses the feedback we have received and offers a roadmap for realising Macquarie Point's potential as a truly iconic national landmark." Premier Hon. Will Hodgman MP.

The Corporation has developed the Reset Masterplan 2017 – 2030 (reset masterplan) based on the Mona vision. The reset masterplan represents the urban design rationale which ground-truths the Mona vision and aligns with the strategic policies of the Planning Scheme.

The reset masterplan focuses solely on the first stage of the Mona vision and is confined to the bounds of the Macquarie Point site as recognised under the existing Planning Scheme.

The proposed Planning Scheme amendments are required to implement the reconfigured layout and uses of the reset masterplan. They comprise a series of updates to the figures and provisions of the Macquarie Point Site Development Plan under Clause 32 of Part F, as well as some minor consequential changes to the references in the parking policy objectives for Activity Area 3 under Schedule 5 of the Planning Scheme.

This assessment has been prepared to support a request by the Board of the Macquarie Point Development Corporation (the Board) to the Minister pursuant to ss 39G(1) of the *Macquarie Point Development Corporation Act 2012* (MPDC Act) for amendments to the Planning Scheme.

It includes a full description of the proposed amendments and the following relevant information to support the request as required under ss39(4) of the Act:

- A statement of the consultation undertaken in relation to the draft of the proposed amendments;
- Demonstration that the proposal furthers the requirements of the objectives set out in Schedule 1 to the *Land Use Planning and Approvals Act 1993* (LUPAA);
- Demonstration that the proposal is consistent with applicable State Policies within the meaning of the *State Policies and Projects Act 1993*;
- Demonstration that the proposal is as far as practicable consistent with the Southern Tasmania Regional Land Use Strategy;
- Confirmation that the proposal is consistent with the Sullivans Cove Strategic Framework under Part B of the Planning Scheme; and
- Confirmation that the proposal does not alter any heritage listings under Schedule 1 of the Planning Scheme.

1. Introduction

This report has been prepared by All Urban Planning Pty Ltd to support a request by the Board to the Minister pursuant to ss 39G(1) of the *Macquarie Point Development Corporation Act 2012* (MPDC Act) for amendments to the Sullivans Cove Planning Scheme 1997 (Planning Scheme). The amendments reflect the reset masterplan that flows from the Mona Vision for the site.

The Minister may approve the amendments under Section 39I of the MPDC Act providing he is satisfied that the proposal:

- furthers the requirements of the objectives set out in Schedule 1 to the *Land Use Planning and Approvals Act 1993 (LUPAA)*;
- is consistent with applicable State Policies within the meaning of the *State Policies and Projects Act 1993*;
- is as far as practicable consistent with the Southern Tasmania Regional Land Use Strategy;
- is consistent with the Sullivans Cove Strategic Framework under Part B of the Planning Scheme; and
- providing the amendments do not alter any heritage listings under Schedule 1 – Conservation of Cultural Values of the Planning Scheme.

The amendment is supported by the following accompanying documents:

- Reset Masterplan 2017 – 2030, MPDC;
- Macquarie Point Masterplan: Reset, Urban Design Notes, Leigh Woolley, 31 May 2017 and addendum;
- Macquarie Point Wastewater Treatment Plant Odour Assessment, Environmental Dynamics, 5 November 2017;
- Assessment of Market Impacts, AEC Group, 30 May 2017;
- Site Remediation Strategy Overview, AECOM, 23 May 2017;
- Heritage Report, Austral Tasmania, 12 May 2017;
- Infrastructure Assessment Update Report, Pitt & Sherry, 8 June 2017; and
- Traffic Impact Assessment, GHD, 1 June 2017.

1.1 Background

The Corporation was established through the MPDC Act and was tasked with the responsibility to manage the remediation and facilitate the redevelopment of the Macquarie Point site.

The Corporation prepared the former masterplan and lodged an accompanying set of amendments to the Planning Scheme in 2015.

A planning scheme amendment, in the form of a Site Development Plan (SDP), was endorsed by Council in December 2015 and approved by the Tasmanian Planning Commission (TPC) in November 2016. Those amendments (2/2015) provided a significant change in strategic direction for the site from an industrial use area to a mixed-use area comprising commercial, institutional, recreational, tourist oriented, entertainment and residential uses.

In December 2016, Mona put forward its vision for the Macquarie Point site focusing on the development of an arts and cultural precinct and a nationally significant Truth and Reconciliation Art Park.

In response to public feedback and recognising that Macquarie Point presents a once in a generation opportunity for Hobart and Tasmania, the Tasmanian Government directed the Corporation to reset the vision for the Macquarie Point site and prepare a new plan for development based on the Mona vision. The reset masterplan focuses solely on the first stage of the Mona vision and is confined to the bounds of the existing SDP.

The area is to be developed to include public space, exhibition space, commercial space, cultural space, conference facilities, accommodation, facilities to support Hobart's role as Australia's Antarctic gateway and tourism infrastructure.

Significant work has been done during 2017-18 investigating odour emissions and potential for environmental harm from the Macquarie Point Wastewater Treatment Plant (WWTP). The findings are outlined in the accompanying odour and noise monitoring and modelling study prepared by Dr Steve Carter from Environmental Dynamics.

On the 18 September 2018, TasWater and the Government announced that the WWTP would be decommissioned and removed within 4 years. Dr Carter' s report supports the discretionary use status for consideration of sensitive uses over the intervening period.

1.2 Site Context

Macquarie Point is located between the CBD, the headland and Sullivans Cove. Measuring approximately 9.3 hectares, the site lies predominantly on the reclaimed cove floor adjacent to the working port, along the Derwent River at the eastern edge of the city.

Today the site has a number of interim uses along with a small office building, micro brewery and sheds used for a variety of events. The site has also been used for other community events including Dark Mofo since 2015 and a range of public events and performances in the Goods Shed.

The site's surrounding land is primarily used for public access and cultural significance, commercial and professional services, retailing, port facilities, light industry, marine industry, fishing industry and educational purposes. Significant landmarks within the general area of Macquarie Point include the Port of Hobart, Cenotaph, Sullivans Cove and the University of Tasmania Centre for the Arts.

The existing site conditions are detailed extensively in the accompanying assessments.

1.3 Title Information & Owners Consent

The proposal relates to the following land shown in Figure 1 below:

Address	Title	Owner
Macquarie Point Development Site	CT113521/1	The Crown (State Growth)
Boral Concrete Plant, 2 Tasman Highway	CT113521/1	The Crown (State Growth)
Royal Engineers Building, 2 Davey Street	CT20452/2	The Crown (Crown Land Services)
8 Evans Street	CT13583/1	Hobart City Council
12 Evans Street	CT210801/1	Aurora Energy Pty Ltd (TasNetworks)

41 Evans Street	CT45404/1	The Crown (Crown Land Services)
Balance Land (Ex Hobart R'Way Yards), 30 McVilly Drive	CT113521/1	The Crown (State Growth)
20 Hunter Street	CT241366/1, CT11646/1, CT19468/1, CT241367/1, CT16130/1, CT15736/1, CT21722/1	Tasmanian Water and Sewerage Corporation Pty Ltd
Strips of land west of the WWTP	CT163944/1, CT163943/1	Hobart City Council
Evans Street		Hobart City Council
47 Hunter Street (carpark at the eastern end of University of Tasmania Centre for the Arts)	CT129483/8	The Crown (Crown Land Services)
Eastern portion of Hunter Street intersecting with Evans Street	CT 129483/9	Hobart City Council

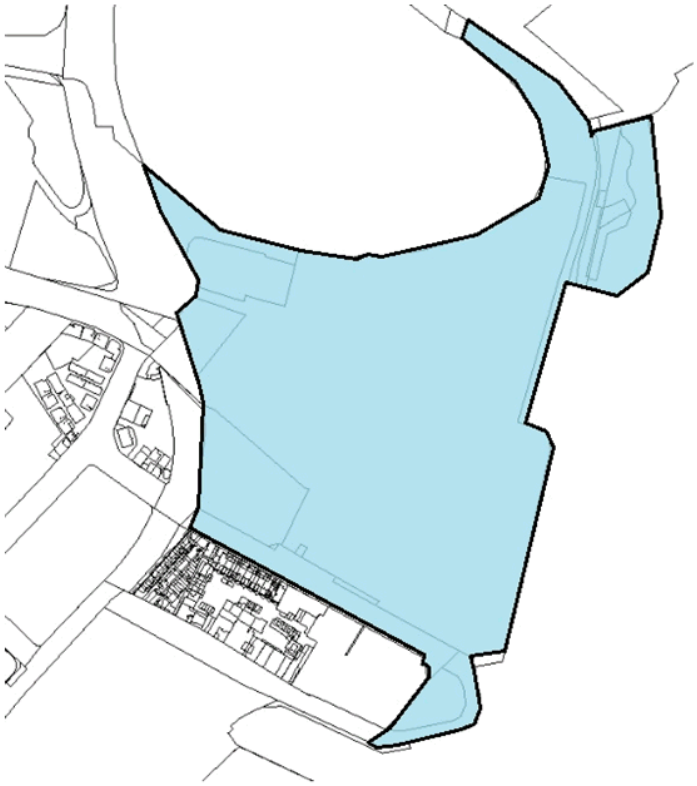


Figure 2 The Site

1.4 The Proposal

It is proposed to amend the Planning Scheme to give effect to the reset master plan. This involves amendments to the Macquarie Point Site Development Plan to replace the spatial figures and adjust the use and development considerations.

The proposed amendments are explained in Section 5.3 below and provided in full in Appendix A.

1.5 Macquarie Point Development Corporation

The Corporation was established via the MPDC Act and was tasked with the responsibility to manage the remediation and facilitate the redevelopment of the Macquarie Point site.

The reset masterplan follows a direction from the Minister to the Board of the Corporation under Section 36(2) of the MPDC Act to amend the Macquarie Point Strategic Framework and Masterplan 2015-2030 (former masterplan). The reset masterplan is an amended site redevelopment plan under Section 37(6) and took effect when approved by the Minister under Section 37(7) of the MPDC Act.

The proposed Planning Scheme amendments are to ensure that statutory consideration of use and development of Macquarie Point is assessed in accordance with the principles and layout of the reset masterplan.

1.6 Community Consultation

The Corporation has engaged with close to 20 consultative groups including over 300 stakeholders at each stage of the reset to provide opportunities for input. The Corporation has consulted with the Aboriginal community over the last 18 months on the concept of the reset vision, with particular focus on one of the key public spaces, named under the Mona Vision, the Truth and Reconciliation Art Park. The Corporation sees the park concept being guided by the Aboriginal community and the wider community on the purpose, design and final name through inclusive, respectful and equitable consultation.

A series of further stakeholder briefings will be held across key business, tourism, arts and culture, political and Antarctic groups. The purpose of these briefings is to inform the stakeholders about the new vision for Macquarie Point and update them on the progress to date.

2. Reset Masterplan

2.1 Opportunity

Macquarie Point aims to inspire a new era of cooperation and optimism in this exciting arts, culture, science and tourism urban renewal development.

The reset masterplan focuses solely on the first stage of the Mona Vision and is confined to the bounds of Activity Area 3 of the Planning Scheme.

2.2 Reset Masterplan Rationale

The reset masterplan represents the urban design rationale which ground-truths the Mona Vision and aligns with the strategic policies of the Planning Scheme.

It outlines the key concepts and proposed uses as well as, importantly, allowing for a built form which respects, recognises and acknowledges the landscape in which it sits.

The key public spaces will form the centerpieces of Macquarie Point. It will be an expression of the people of Tasmania and embody the values and ideals of our community.

The reset masterplan envisages a connected and active place at ground level and the mixed-use nature of the site is demonstrated by the flexibility offered in the use area plan.

Figure 3 - Proposed master plan use areas

Arts and institutional uses are proposed adjacent to the boundary shared with the Hobart port reflecting the need to provide a buffer zone of non-sensitive uses.

The siting of these uses also makes provision for the possible requirement for some direct access into the port area to support both the Antarctic and science precinct and TasPorts' intention to increase Antarctic and tourism activity on the Hobart Port.

The remainder of the site presents opportunities for mixed-use development.

Unlike the former masterplan, the reset masterplan does not designate building lots, rather it offers larger parcels with the flexibility to respond to the nature and scale of the specific development and market demand providing the strategic principles which underpin the Planning Scheme are furthered.

The buildings adjacent to the key public spaces have the potential to become significant architectural statements and mark the entry to the site.

The design, bulk and placement of these buildings are especially important, as this area will define the view along Davey Street into the site and to the Cenotaph.

As with the former masterplan, car parking will be kept to the periphery of the site as much as possible to emphasise the prioritisation of pedestrians under the site's mobility network.

The ultimate arrangement of uses over the life of the development will be informed by the Corporation's land release strategy and discussions with potential developers.

Strategic Principles of the reset masterplan

The former masterplan identified eight underpinning key drivers which provided a structure upon which the narrative for the site was built.

The reset masterplan acknowledges, recognises and realigns the urban design values and spatial rationales of the former masterplan in the context of the strategic policies of the Planning Scheme:

1. **Continuous shared history**

The Cove shall display its history: Macquarie Point will be an expression of the people of Tasmania embodying the values and ideals of our community. The Hobart area was home to the Muwinina band of the South East Tribe of Aborigines and evidence of their activity has been found in the site's surrounds.

Macquarie Point has a long history of use associated with early European settlement, including defence, sanitation, industry, including the Hobart gasworks and transport. Until recently, the site was predominantly used as a railyards and for freight handling. The site has a proud history as a working port which still operates today.

2. **Reconnecting Cove to River**

Creation of better physical and visual links to the water from the city: While the aspiration is to eventually be able to walk or cycle the full length of the Intercity Cycleway from as far away as Mona or Taroona, the pathway is currently broken by the site itself.

There is now an opportunity to complete this network, opening the site to the community for the first time since 1850, while providing a connection between Sullivans Cove and the Regatta Grounds.

3. **A cultural asset**

Sullivans Cove is a cultural, artistic and festive focus for the city: the reset masterplan aspires to transform the industrial site of Macquarie Point into an internationally significant cultural precinct, which builds on its location to establish a critical mass of art and cultural activity which is integrated with existing cultural assets within a wider cultural precinct.

4. **Diversity of uses**

The Cove offers a diverse range of activities for residents and tourists alike: The reset masterplan will be mixed-use in nature and sufficiently flexible to accommodate fluctuations in future market demand. To attract locals and visitors year-round, the site must offer ongoing diverse activity which spans culture, recreation and tourism while complementing commercial uses such as bars, cafes and

restaurants. Pop-up and temporary uses will activate the site prior to and during the development phase.

5. A landscape for people

The Cove retains the pedestrian scale that existed during the early settlement of Hobart: Macquarie Point is a low-lying site, located in a city which is understood from elevated views. In particular, the views to and from the site from the headland, places Macquarie Point in the context of its surrounding landscape, while importantly, ensuring it remains a place for Tasmanians.

6. Spaces which connect

The Cove is one of the world's finest city landscape settings: The reset masterplan presents an opportunity to unlock an open space network and become a central connector between the city and the Queens Domain. The masterplan is intended to open large areas of the site to the public and provide connecting pathways from Evans Street to the Cenotaph.

The key public spaces will form the centrepiece of Macquarie Point and the entrance to the site and offers a glimpse of the headland and beyond.

7. Mobility policy

Enhance the pedestrian experience in the Cove: Macquarie Point will have strong pedestrian and cycling links within the site itself to reconnect the site with its surrounds. The street network will minimise vehicular access to the heart of the site. To ensure future transport networks can be incorporated within the site, corridors for the movement of light rail and heavy vehicles will be reserved where they traverse the site.

The proposed Planning Scheme amendments provide flexibility for consideration of a range of uses and design solutions, providing the principles of the reset masterplan and the Planning Scheme are met.

3. Existing Planning Controls

3.1 Planning Scheme context

The site incorporates the Former Railyards and Boral concrete batching plant 'Key Sites' under Part F of the Planning Scheme. The Key Site status means that the Planning Authority has identified the site as having the potential to be used or developed to achieve a range of strategic planning objectives.

The site is contained within Activity Area 3.0 which also matches the extent of the Macquarie Point Site Development Plan as shown on Figure 4 of the Planning Scheme (see Figure 4 below). The provisions for the SDP are set out under Section 32 of the Planning Scheme and are intended to facilitate the identified preferred future through promotion of appropriate use and development on strategically important and presently under-utilised sites within the Cove.

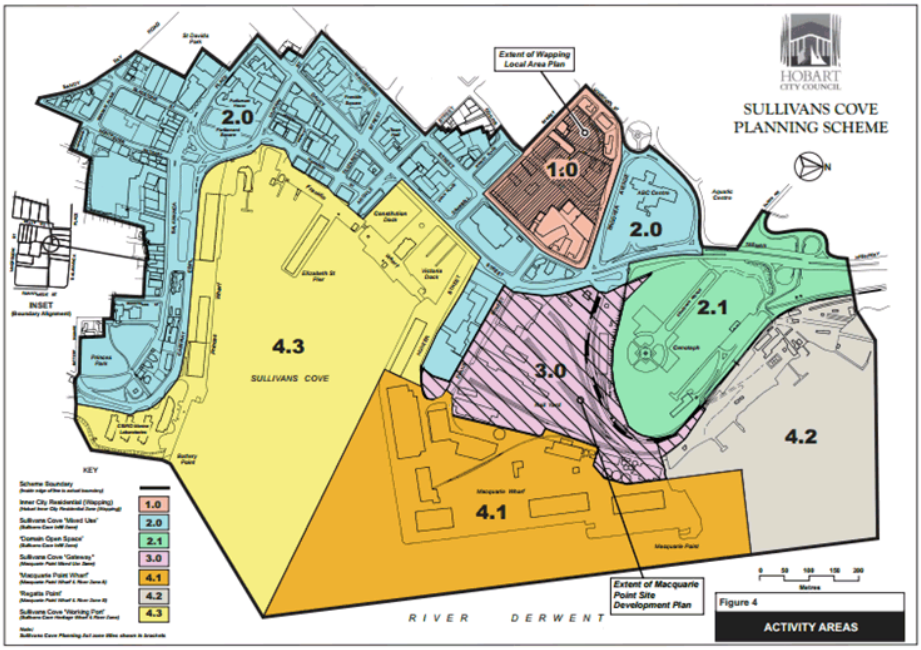


Figure 4 – Activity Areas (Figure 4) Sullivans Cove Planning Scheme

3.2 Site Development Plan - Performance

Under Clause 31.4 the proposed amendments to the SDP are to reflect:

- *the provisions of the Strategic Framework (Part B);*
- *the Objectives and Performance Criteria of the relevant Activity Area (Part D); and*
- *the Objectives and provisions of the Schedules (Part E) of the Scheme.*

Clause 31.5 also requires that the following matters are considered in a SDP affecting the Boral Site:

- *the visual contribution to any new access road servicing Activity Area 3 and with the potential to also service Activity Area 4.1 (though application for the road itself is not 'discretionary' under the Scheme and does not require the preparation of a Site Development Plan).*
- *the visual contribution to the Tasman Highway 'gateway' into the Cove.*
- *the complementary relationship to the Royal Engineers Building, i.e. any development should be less visually prominent than the Royal Engineers Building grounds or as part of the setting of the Royal Engineers Building.*
- *the view down Macquarie Street to the Cenotaph.*

3.3 Strategic Framework (Part B)

The relevant considerations of the Strategic Framework include Section 5 - Values and Strengths of the Cove, Section 6 - Preferred Future for the Cove and Section 7 - Planning Principles for Management of Activities in the Cove

The Guiding Principles of the Strategic Framework are:

- *Sullivans Cove shall continue as a dynamic and evolving working port, also as a fishing and yachting harbour, cultural centre, recreation and entertainment district, centre of government and a place for commerce and living.*
- *it shall continue to cater for public activities in streets and in buildings at street level.*
- *it shall display its history, and have a life beyond 'nine-to-five' hours.*
- *the activities in the Cove should positively contribute to the character of the Cove and not detract from the operations of a working port. Activities and associated development should not adversely impact on pedestrian and other forms of movement through the Cove, access to the water edge, views, and the human scale environment.*
- *the water environment of the Cove shall continue to fulfil a significant role in the cultural life of the City, and shall continue to cater for community events such as boat races and festivals.*
- *the Cove should be promoted as Hobart's centre for cultural and recreational activities. Such activities shall be encouraged across the Cove, with an emphasis on cultural activities in the main Cove, including between Hunter Street and Salamanca Place and the Theatre Royal, Museum and Art Gallery.*

Of particular relevance is the reference to this site in the Strategic Directions Figure 2 of the Planning Scheme for mixed use development opportunities, consistent with the MPDC Act.

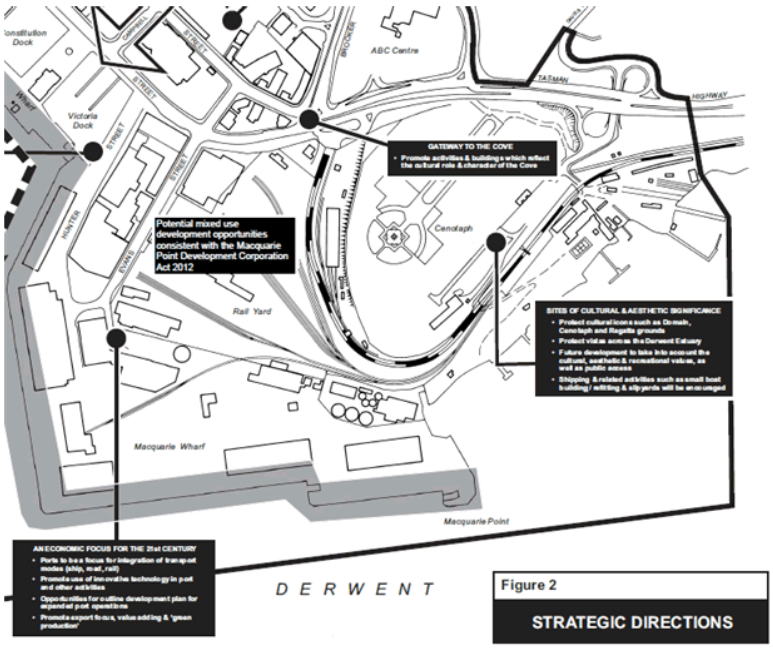


Figure 2
STRATEGIC DIRECTIONS

Figure 5 – Excerpt from Figure 2- Strategic Directions of Part B of the Sullivans Cove Planning scheme. Note the specific reference for mixed use development opportunities consistent with the Macquarie Point Development Corporation Act

The Strategic Framework is heavily influenced by the urban design analysis of the Sullivans Cove Planning Review 1991. As discussed in Leigh Woolley's accompanying advice, this urban design foundation is equally relevant to the concepts which underpin the reset masterplan. In particular, the reset masterplan:

- responds to the urban pattern of Sullivans Cove;
- maintains important view lines;
- sets a built bulk and height standard that will be sympathetic to the natural topography of Sullivans Cove, the amphitheatre and the Regatta Point Ridge;
- provides a mechanism to ensure that future development has a respectful relationship with existing buildings and the landscape; and
- provides for the creation of primary, secondary spaces and urban gardens.

3.4 The Objectives and Performance Criteria of the relevant Activity Area (Part D);

The objectives for use and development in Activity Area 3.0 are represented as Desired Future Character Statements in clause 32.3 of the 'Macquarie Point Site Development Plan' under Part F of the Planning Scheme.

The proposed amendments involve some adjustment to the Desired Future Character Statements, as well as the use and development provisions of the SDP to reflect the reset masterplan. These changes remain consistent with the strategic framework of the Planning Scheme.

4. Assessment of the Reset Masterplan

4.1 Urban Form

The proposed amendments include some change to the Desired Future Character Statements (32.3), height and siting plans (Figures 32.3 and 32.4), development standards (32.7.3 to 32.7.7) and general considerations (32.4) to implement the height, siting and design concepts from the reset masterplan.

The following concepts are embodied in the proposed amendments and are considered to be highly consistent with the Objectives for Urban Form under Section 23.2:

- the bulk, height and siting of buildings are to be sympathetic to the natural topography of the headland, escarpment surrounding the Cenotaph and reinforce the natural shoreline;
- maintain important views as identified on Figure 32.4 of the SDP;
- enrich the meaning and memory of the changing nature of Macquarie Point over time through expression of the use and development layers from the past including the topography, natural shoreline, Round House, Goods Shed and Royal Engineers Building;
- develop a network of connections through and around the site including a series of primary shared street spaces extending north from Evans Street towards the centre of the site; and smaller and more intimate secondary spaces. Their position can be adjusted to suit specific development as it unfolds;
- reinforce a well-defined built edge to Evans Street, set back to highlight the Goods Shed as a public entry point to the site;
- built form is to be 'set in the round' on the 'cove floor';

- buildings are to incorporate articulated roof forms to provide interest when viewed from elevated surrounding areas of the Cenotaph and Domain.

4.2 Building envelopes and view lines

The former masterplan identified and modelled specific building height areas that translated to Figure 32.4 of the SDP. The proposed updates to that Figure reflect an overlay of the use areas of the reset masterplan with the heights of the former masterplan. Where the 2017 use areas extended over more than one 2015 building envelope, the lowest of the 2015 building envelope heights has been taken to be the permitted height for the proposed replacement Figure 32.4.

Applying the lowest of the 2015 building heights as the permitted height for the 2017 use areas ensures that the 2017 Planning Scheme amendments go further in ensuring that the important views and sightlines are not unreasonably impacted.

The following figures compare the permitted building envelopes of the existing Figures 32.3 and 32.4 with the proposed replacement envelopes under the new Figures 32.3 and 32.4.

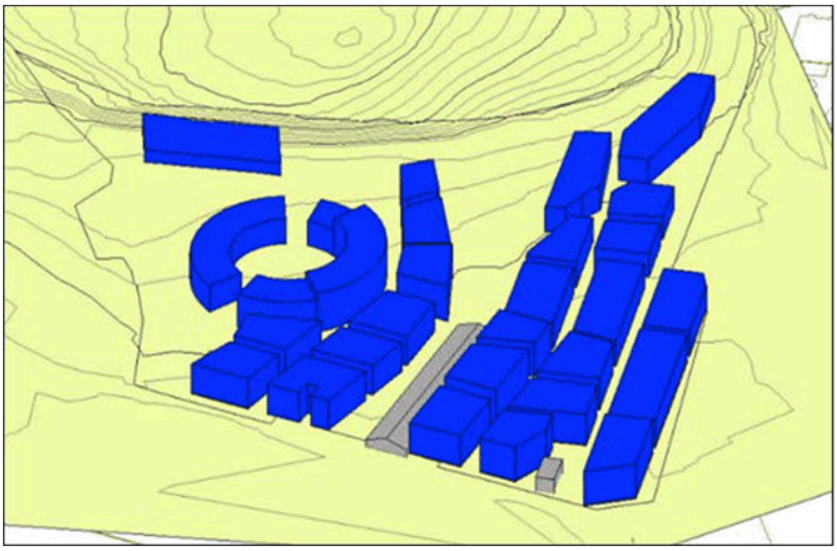


Figure 6 – 3D modelled building envelopes of the existing Figures 32.3 & 32.4 of the Planning Scheme

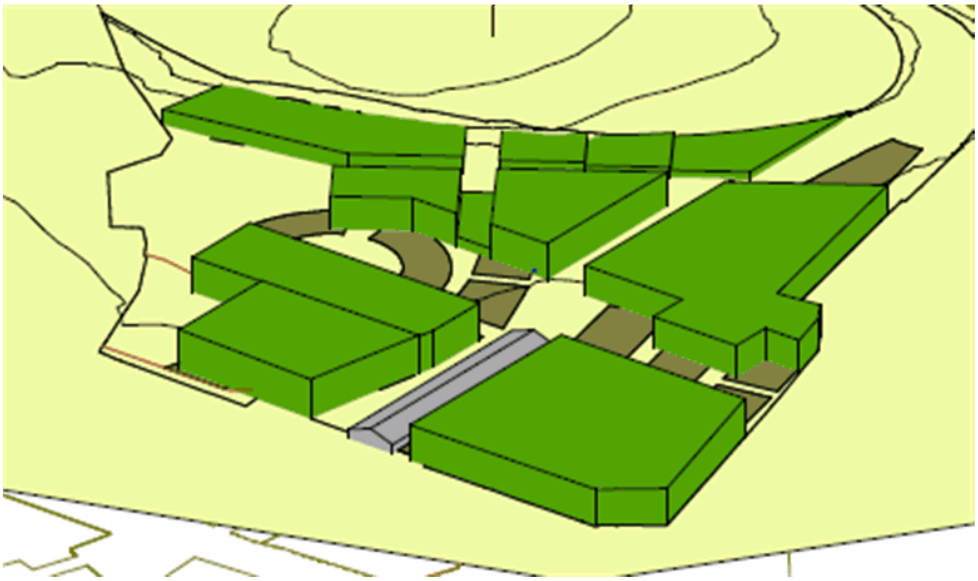


Figure 7 - 3D modelled building envelopes of the proposed replacement Figures 32.3 & 32.4 To be updated for consistency with Figures 32.3 and 32.4

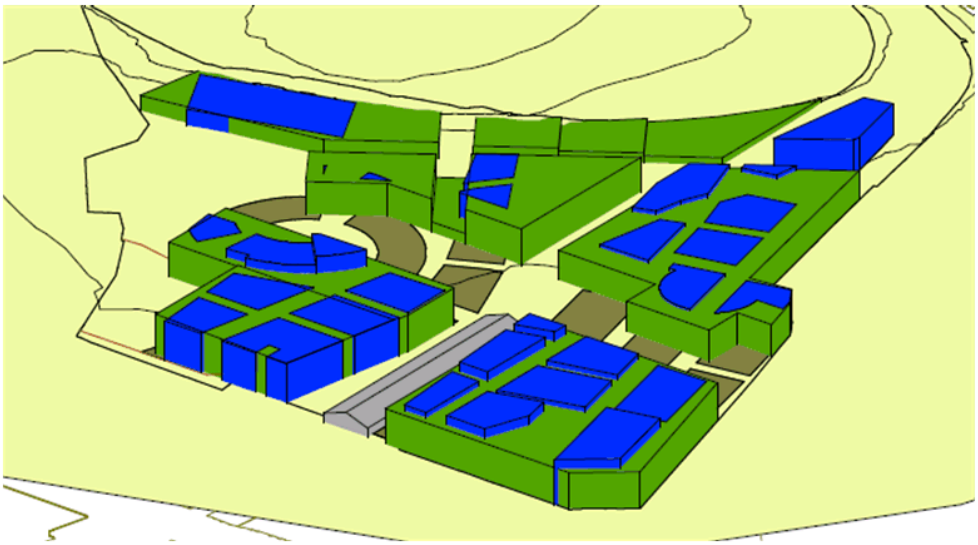


Figure 8 – Comparison of 3D modelled building envelopes of the existing and proposed replacement Figures 32.3 & 32.4 To be updated for consistency with Figures 32.3 and 32.4

Leigh Woolley has undertaken a comparative analysis of the proposed reduced building envelopes as part of his advice which accompanies this proposal. That work demonstrates that the proposed permitted envelopes under the replacement Figure 32.4 will significantly reduce the impact on those envelopes as viewed from the previously established important viewing points, including from the Cenotaph and within the cove.

Height area F on Figure 32.4 is set at 11m AHD which equates to approximately 4m above ground level. This will ensure that view 9 to and from the Cenotaph to the centre of the Key Public Space will be maintained. This view line is illustrated in a concept section below in Figure 9.

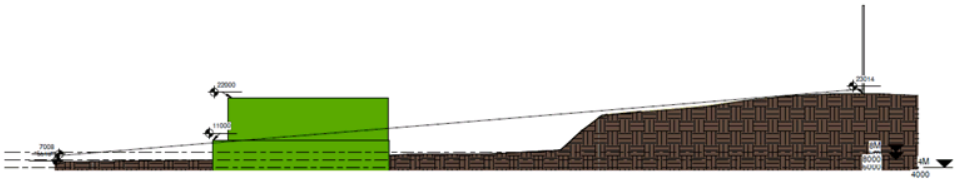


Figure 9 - Concept section through Use Area 2.2 on Figure 32.1 showing Height Area F on Figure 32.4 will preserve view 9 on Figure 32.2 (Source MPDC)

Height areas A, G and H on Figure 32.4 have been set below surveyed heights of the top of the escarpment adjacent to the north. These envelopes have been shaped to ensure that the siting and alignment of buildings adjacent to the escarpment are sympathetic to the natural topography of the headland, amphitheatre and escarpment surrounding the Cenotaph, and reinforce the natural shoreline. Development in this area will also be subject to Performance Criteria P1 of 32.7.2 that prevent buildings from protruding above the escarpment when viewed from the Cenotaph.

4.3 Traffic

Under the reset masterplan, development will continue to have strong pedestrian and cycling links within the site itself and to reconnect with its surrounds including the Hobart waterfront and CBD, Intercity Cycleway and Queens Domain. The street network will minimise vehicular access to heart of the site. To ensure that future transport networks can be incorporated within the site, corridors for the movement of light rail and heavy vehicles will be reserved where they traverse the site.

The proposed network includes essentially two layers:

- Movement of vehicles will be focused on Evans Street, and the access from the Tasman Highway to the Escarpment area. Access to particular development sites and car parking areas will be off Evans Street or the Escarpment car park access. Whilst the internal street network has not been precisely defined, it is not expected that there would be connectivity through the site, for instance between the Escarpment and Evans Street.
  - A potential future connection between Evans Street and the Regatta Grounds (possible "Northern Outlet") has been identified, but this has not been assessed as part of this current proposal.
  - Light rail, should it connect to the site in the future, would enter from Davey Street, around the bottom of the escarpment to the Northern Outlet alignment.
- The pedestrian movement network comprises various corridors crossing the site, in addition to the vehicular corridors described above which would also provide for pedestrian movement. There will be two primary pedestrian corridors, meeting at right angles in the centre of the site. One corridor is essentially an extension of the Brooker Avenue alignment. The other primary corridor is a continuation of Franklin Wharf, connecting Hunter Street with the site through the University of Tasmania/IXL buildings between Hunter Street and Evans Street. The nature of these connections, and any road crossings, has not been determined at this stage. Secondary pedestrian corridors will connect to the primary corridors and locations including the Cenotaph/Regatta grounds, and the Mac 2 Cruise Ship terminal.
  - Access for cyclists would utilise a combination of the vehicular network and the pedestrian network, providing a high degree of accessibility through the site.
  - A pedestrian link that traverses the escarpment is to be provided between the Cenotaph and the Key Public Space.

The reset masterplan maintains the proposal for a maximum of 350 off-street parking spaces on the Macquarie Point site, with an additional 350 spaces in the escarpment car park area.

The accompanying Traffic Impact Assessment by GHD indicates that the volume of peak period traffic activity associated with the reset masterplan is generally less than assumed in the previous (2015) assessment. An increase of some 50 vehicles per hour is expected in the PM peak, departing the site via Evans Street. However in the context of the overall volume of traffic activity from Macquarie Point, and already on the network in the vicinity, this increase is relatively minor. The previous assessment identified some improvements that could be made to the intersection of Evans Street with Davey Street to improve egress from the site in the PM peak in particular.

GHD advises that the following traffic recommendations that applied to the former master plan and existing SDP provisions remain appropriate for this current proposal and are considered to still apply:

- In the absence of clear infrastructure-based solutions to improving egress from the development site, it is recommended that travel demand management measures be considered as part of the development planning. Some measures are already in place, such as a limitation on car parking and provision of high quality pedestrian and bicycle links within the site. Other measures may include:
  - *Work with Metro Tasmania to optimise public transport service integration into the development to maximise public transport mode share.*
  - *Provide high quality pedestrian and bicycle connections to the CBD and surrounding areas.*
  - *Promote extended opening hours for retail and other activities on the site, to encourage people to "linger longer" and flatten the profile of departures from the site in the PM peak period.*
  - *Encourage longer-stay parking activity by visitors in particular, so that parking turnover does not create unnecessary traffic movement.*

4.4 Market Impacts

The market impacts of the reset masterplan are assessed in the accompanying update by AEC Group.

The former masterplan took a more prescriptive approach to allocating floorspace across uses, whereas the new reset masterplan designates maximum floorspace caps to various uses - enabling flexible delivery of the development over a 15 year+ horizon.

Table 1 compares the land uses and respective floorspace contemplated by the respective masterplans.

2015 Masterplan		*Reset Masterplan*	
Proposed Land Uses	Gross Floor Area (m^2)	Proposed Land Uses	Maximum Gross Floor Area (m^2)
Education/Research	13,616	Education/Research	50,000
Commercial	54,462	Commercial	30,000
Retail	9,413	Retail	10,000
Hotel	15,695	Hotel	20,000
Residential	43,949	Residential	15,000

Table 1 – Proposed Land Uses and Floor Space – reset Master Plan v Former Master Plan

Principally, the difference in quantum of floorspace envisaged in the reset masterplan compared with the former masterplan is a substantial increase in floorspace for education and research uses (from 13,600m^2 to a potential maximum of 50,000m^2 GFA). Other differences include:

- The maximum floor area limit for Residential uses has been reduced from 43,949 to 15,000.
- Commercial floorspace is reduced to a maximum of 30,000m^2 from circa 54,500m^2.
- Hotel uses are increased slightly, from around 16,000m^2 to a maximum of 20,000m^2.
- Retail uses remain broadly unchanged, previously circa 9,400m^2 to 10,000m^2.

AEC make the following comments on potential market impacts of the reset masterplan:

Commercial

The proposed commercial space at Macquarie Point was not expected to directly compete with commercial space in the Hobart CBD. The commercial component at Macquarie Point is expected to provide for non-traditional floorspace, accommodating occupiers which have synergistic relationships to Antarctic research and associated industry.

Additionally, given the reset masterplan contemplates a reduced quantum of commercial space, market impacts are likely to remain benign.

Education/Research

The increase in quantum of floorspace for education/research uses is not expected to have impact implications for existing markets given the specific purpose the space will be utilised for.

Hotel

The proposed hotel uses were not expected to adversely impact the existing hotel market as significant demand for new hotel accommodation at Macquarie Point was expected to be generated by the development itself - accommodating visiting professors, researchers, academic and professional staff participating in Antarctic research.

The slight lift in contemplated hotel floorspace is not expected to result in a different impact to that assessed in 2015. Long term staging of the hotel development is likely to further mitigate any negative impacts the hotels may have on existing supply across the Hobart hotel market.

Retail

The 2015 impact assessment found Hobart CBD was expected to remain as the premier non-food retail destination for residents and some impact could be felt by other retail facilities throughout Hobart. Notwithstanding, the retail facilities offered at Macquarie Point were assessed as likely to have negligible impact on the overall retail hierarchy, being of a different retail offering and staged over a considerable number of years which allows the spreading of impact and absorption by sales growth. The floorspace contemplated in the reset masterplan does not alter this assessment.

Residential

The reset masterplan has a reduced focus for residential development now reducing the maximum floor area limit from 43,949m^2 to 15,000m^2. This limit reflects the shift under the reset masterplan to a more civic focus for the site and to ensure that uses contribute to the interest and activity of the area. The proposed amendments include standards to manage the potential for land use conflict with the working port, WWTP and use of Macquarie Point as a major public entertainment venue. These matters are discussed below.

4.5 Infrastructure

The accompanying Updated Infrastructure Assessment prepared by Pitt & Sherry confirms that, in broad terms, there is sufficient capacity within existing power, communication, sewer, water and gas networks to service development in accordance with the reset masterplan with only limited off site works and payment of standard authority charges.

As with the former Masterplan, the specifics of the stormwater system have not been fully resolved at this stage. However, given its proximity, it is expected that should the existing connections not be acceptable, any new development would be able to discharge readily to the river.

4.6 Waste Water Treatment Plant Impacts

The requirements under clause 32.14.6 of the Planning Scheme mandate that twenty uses cannot be sited within 400 m of the Macquarie Point Wastewater Treatment Plant (WWTP) whilst it is still operating, unless a site-specific report is provided that satisfies P2 of clause 32.14.6.

The Corporation proposes amendments to clause 32.14.6 in line with the State Planning Provisions for sensitive uses with a distance of 400 m from the boundary of the WWTP.

The existing Clause 32.14.6 flowed from evidence provided to the TPC during hearings on the SDP amendments to the Planning Scheme in 2016. At that time, all evidence was on a 'desktop basis'. The accompanying November odour audit and modelling report prepared by Environmental Dynamics brings new odour and noise modelling evidence informed by on site odour and noise sampling.

Environmental Dynamics concludes that:

- *the primary sedimentation tank (PST) biofilter, the main stack and the cogeneration stack of the WWTP are not the dominant odour sources that were expected from the 2014 desktop study;*
- *The PST biofilter has almost zero emissions; the cogeneration stacks emissions are very hot and disperse very well due to their buoyancy; and the trickle filters are not large odour sources, and the odours are further reduced by treatment ahead of discharge through the main stack;*
- *The 2017 odour audit and sampling has found the main odour sources are the emissions from the tanker unloading, and fugitive odours from the nearby inlet works area; and*
- *If these odour sources are mitigated, then the remaining odour sources are such that a reduction of the 400-m attenuation distance to a 200-m attenuation distance is appropriate even without further odour mitigation.*

The following Figure 10 shows the modelling predictions that support the proposed attenuation distance reduction.

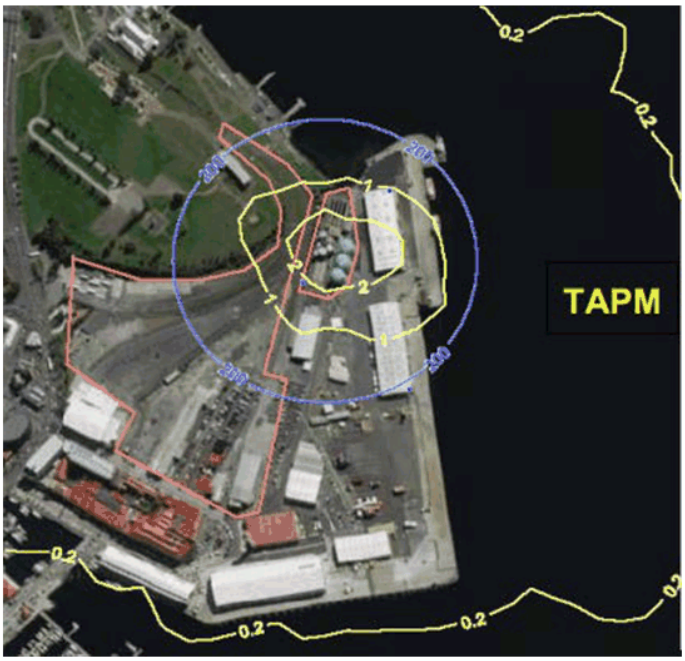


Figure 10 - Maximum odour GLC (1 hour) predictions for a future scenario in which fugitive emissions from tanker unloading and the inlet works are mitigated. The design GLC is 2 OU (1 hour), so the predictions are consistent with allowing the set back to be relaxed to 200 m. (Source Environmental Dynamics November report 2017)

On the 18 September 2018, TasWater and the Government announced that the WWTP would be decommissioned and removed within 4 years. Dr Carter' s report supports the discretionary use status for consideration of sensitive uses over the intervening period.

4.7 Heritage

As outlined in the accompanying report by Austral Tasmania, the site has been subject to a number of heritage investigations which are relevant to the proposed Planning Scheme amendments. These are:

- Macquarie Point Railyards Site Heritage Review, final report prepared for Macquarie Point Development Corporation, November 2013: This report was prepared to review the existing knowledge about heritage places and values within the site; define what places were of the highest level of cultural significance; and to establish priorities for future work;
- Built Heritage Assessment for the Macquarie Point Site, final report prepared for Macquarie Point Development Corporation, May 2015: This report assessed the cultural significance of the Goods Shed and the Red Shed located on the site; and
- Macquarie Point Historical Archaeological Test Excavations, final report prepared for Macquarie Point Development Corporation, July 2015: This report contains the results of a series of archaeological test excavations carried out in December 2014 in accordance with Planning Permit PLN-14-01210-01.

Schedule 1 of the Planning Scheme applies to carrying out 'building or works' on places of cultural significance and excavation within places of archaeological sensitivity. The following summarises key findings relevant to the Planning Scheme provisions.

Conservation of Places of Cultural Significance

The SDP area currently contains only the Royal Engineers Building, Goods Shed and the Red Shed as places of cultural significance in Table 1 and Figure 5 of Schedule 1.

The proposed amendments do not affect these listings and future 'building or works' to these places would therefore continue to be subject to the provisions of clause 22.4 of the Planning Scheme.

Places of Archaeological Sensitivity

The site includes two places of archaeological sensitivity identified in Table 2 and Figure 5a of Schedule 1. These two places are the:

- 'Royal Engineers Headquarters and Kings Yard' (Ref. No. 12); and
- 'Hobart Rivulet - Domain Diversion Tunnel' (Ref. No. 90).

Other parts of the site are not identified in the Planning Scheme as places of archaeological sensitivity, although the general provision of clause 22.6.1 relating to excavation within the planning area may be applicable. Two phases of archaeological test excavations have occurred within site no. 12, and no investigations have been carried at site no. 90 which only partially intersects with the site and is an operating item of infrastructure.

Test excavations within site no. 12 occurred in 2008 and in December 2014. The spatial definition of site no. 12 in Figure 5a has been found to be excessively large in both the 2008 and 2014 works, confirming remnant and discrete areas of archaeological potential, but high levels of past disturbances which have impacted on the archaeological potential of the place.

The Test Excavation report (July 2015) provides a revised spatial definition of the archaeological sensitivity of the place in response to this reduced level of potential (see Figure 1 of the Test Excavation report). Recommendations have been made according to the assessed levels of significance of particular sites or features within site no. 12, with an emphasis on in situ preservation of the most significant sites, to salvage excavation in advance of proposed redevelopment for other features.

Excavation within site no. 12 does not currently satisfy the exemption category of clause 22.6.2. However, the Test Excavation report recommends that that no further archaeological investigation is required for excavations occurring outside of the revised sensitivity zoning. In this scenario a statement could be provided by a qualified archaeologist that refers to clause 22.6.3, that the site has been surveyed previously and found not to be of archaeological significance.

Excavations occurring within sites defined in the Test Excavation report as having archaeological sensitivity will require the approval of an Archaeological Sensitivity Report in accordance within the Planning Scheme definition.

The proposed amendments do not affect the application of these provisions.

4.8 Contaminated Land

A site Remediation Strategy Overview by AECOM accompanies this request and provides an update as of 2017.

Historic contamination at the site is a legacy of past land uses, in particular the former gasworks in the vicinity of the southwest area of the site, fuel handling and transfer in the central portion of the site, and historical bulk fuel storage facilities located in the general eastern portion of the site. The

remediation of the site presents a significant challenge, both technically and financially, and the corporation is following a complementary approach to planning and remediation. That is, the level of remediation will be informed by the specific land uses in a given area, and likewise, planning will be informed by the nature and extent of contamination on Site.

The original Site Remediation Strategy was prepared in 2015 based on the information available at the time, and later informed by the release of the vision and master plan developed for the site. In December 2016, the Tasmanian Government announced that it had reset the vision for Macquarie Point. An updated Site Remediation Strategy has been prepared to support the new vision and the future redevelopment of the site (refer AECOM Site Remediation Strategy Update 2017, Macquarie Point Development Project DRAFT, dated 19 May 2017).

In order to support the new vision, it is important therefore that the Site Remediation Strategy is flexible and able to respond to changes to development proposals over time, as well as respond to changes in remediation technologies that may occur over the life of the project. The ongoing purpose of the Site Remediation Strategy is to provide:

- A flexible framework for site remediation that is commensurate with the Site Development Plan and integrates with ongoing development of the Site; and
- An overarching approach for remediating the site with consideration to technical, financial, timing, logistical and regulatory considerations.

It is anticipated that the Site Remediation Strategy will be refined and updated as:

- Site assessment and remediation works are completed;
- The delivery of the Site Development Plan progresses;
- Land use details are more refined; and
- New data becomes available.

Following release of the 2015 Site Remediation Strategy, detailed investigations and remediation works have been completed at the Site. These works have helped to increase the confidence around the remediation approach and the indicative costs for overall remediation costs for the Site.

The MPDC Act and the contaminated land provisions under Section 32.14 of the SDP enable an accredited Environmental Auditor to be appointed to certify that parts of the Site are suitable for the proposed purposes.

The Corporation has engaged an independent Site Environmental Auditor to provide confidence to key stakeholders that environmental investigations and remedial activities have been completed to a level compliant with required standards. As there are no legislated audit procedures in Tasmania, the Corporation is following the Victorian audit scheme. The ultimate outcome of the Environmental Audit is to obtain a site suitability statement confirming the site's suitability for intended future uses.

There has been extensive consultation and liaison with the Corporation's Site Environmental Auditor as works have progressed, and, at the time of preparing this revised Site Remediation Strategy, the Corporation is preparing to lodge a submission with the Site Environmental Auditor to achieve sign-off for the first portion of the site- the Goods Shed.

Remediation works associated with the Roundhouse Refuelling Area and the SeaRoad Shed are also approaching the stage where the Corporation will prepare a submission for these areas to achieve sign-off.

4.9 Aboriginal Heritage

Aboriginal heritage investigations of the site have been undertaken and no sites of significance have been identified.

4.10 Climate Change

To support the Infrastructure Australia submission for funding, the Tasmanian Government commissioned GHD to prepare a climate change impact assessment in July 2012. The purpose of the assessment was to review the effect of storm surges and sea level rise on the proposed development of the Macquarie Point site.

The analysis indicated that:

- 1 in 100 year Inundation Level due to sea level rise and storm surge for the site is 2.3m above Australian Height Datum (AHD); and
- A 0.5m freeboard will be required for habitable floors (i.e. 2.8 AHD minimum level).

The Development Standard for Inundation Hazard under Clause 32.7.9 of the SDP will remain and ensure that the finished floor level of a habitable room is no less than 2.8m above AHD.

5. Amendment Sullivans Cove Planning Scheme

5.1 Draft Amendment

The draft amendment is to amend the Site Development Plan under Section 32 within Part F of the Sullivans Cove Planning Scheme 1997. The proposed amendments to the Ordinance and Figures of the Planning Scheme and are detailed in Appendix A.

5.2 Reasoning for the Proposal

The purpose of the SDP flows from the Minister's directions under Section 36(2) of the MPDC Act to prepare a replacement site master plan under Section 37 of the MPDC Act reflecting the Mona Vision.

5.3 Changes to the Ordinance and Existing Figures

Amendment - 1

Sullivans Cove 'Gateway' Activity Area 3.0

Update place references to reflect the spatial terms used in the reset masterplan.

Amendment – 2

Replaces the Macquarie Point Site Development Plan under Section 32 of the Planning Scheme involving the following amendments:

Amendment 2.1

Amend Clause 32.1.1 of the SDP to change the reference from the former master plan to the reset masterplan.

Amendment – 2.2

Amend the definitions for Cove Floor and Primary Space to reflect the new layout under the reset masterplan.

Amendment – 2.3

Insert a new clause that allows consideration of interim or temporary use and development for a period up to 5 years providing buildings are located and designed in a manner that does not prejudice the future development of the area or appropriate pedestrian, cycle and vehicle linkages through the site to adjacent Activity Areas.

Amendment -2.4

Amend the Desired Future Character Statement under 32.3.4 to reflect the removal of a physical building envelope from the reset masterplan layout. The former Round House is now to be acknowledged as a landscape element.

The Key Public Space located close to the intersection of the Brooker and Tasman Highways and Davey and Evans Streets will now form the landmark entry to the site for those approaching from the CBD.

Amendment – 2.5

Amended the Desired Future Character Statement under 32.3.7 in accordance with the Urban Design advice of Leigh Woolley to ensure that buildings on the Cove Floor are to be freestanding and built in the round as opposed to the regular street grid of buildings on natural ground.

Amendment – 2.6

Amend the view lines under the Desired Future Character Statement at Clause 32.3.8 to:

- Replace the reference to the Water to Water Promenade with the view aligning NE/SW from Sullivans Cove to the Derwent River;
- Insert a new reference to the important view to Kangaroo Bay;
- Insert a new reference to the view along the Key Public Space;
- Remove the previous view 4 from the centre of the Round House to the Cenotaph and replace with a new view 9 to and from the Key Public Space to the Cenotaph; and
- Remove view 3 from Davey Street to the centre of the Round House and replace with a new view 10 from Davey Street to and from the entry to the Key Public Space; and
- Insert new view line 11 from the Cove Floor to the Cenotaph.

The updated views are shown on the amended Figure 32.2 (Amendment 2.26 below) and reflect the reorganisation of the site under the reset masterplan. The reset masterplan acknowledges the former Round House but reduces its emphasis with the focus now the central Key Public Space. View lines 3 and 4 are amended and replaced with views 9 and 10 accordingly.

View 9 sits between the two height areas D and E shown on Figure 32.4 to the north of the Key Public Space. This view is discussed further in relation to Amendment 2.24 below.

Amendment – 2.7

Amend the Desired Future Character Statement under Clause 32.3.9 to remove the reference to the industrial saw tooth roof form and insert a new example for rooftop gardens.

The reset masterplan moves away from the industrial/ saw tooth form focus of the former masterplan.

Amendment – 2.8

Amend the Desired Future Character Statement under Clause 32.3.11 to respond to the updated spatial network of the reset masterplan and associated replacement Figure 32.3.

As discussed in the updated Traffic Impact Assessment and Section 4.3 above, external access and circulation arrangements under the former masterplan do not alter under the reset masterplan or the proposed amendments.

Amendment – 2.9

Insert a new Desired Future Character Statement at Clause 32.3.12 noting the requirement for a direct pedestrian link between the Key Public Space and Cenotaph that traverses the escarpment. It is expected that this will most likely require installation of a lift or similar for accessibility.

Amendment – 2.10

Insert a new Desired Future Character Statement at Clause 32.3.13 to reflect the intended gateway building at the western entry of the site in the vicinity of the Concert Hall and intersection of Davey and Evans Street.

As discussed in the Urban Design notes prepared by Leigh Woolley it is envisaged that this building will be highly transparent and allow visual connectivity through the envelope to the Key Public Space and beyond from Davey Street. Suitable designs may include lifting the building above the ground plane in whole or part to assist connectivity. The building will also provide an edge to the primary site alignment of the Key Public Space.

Amendment – 2.11

Insert a new Desired Future Character Statement at Clause 32.3.14 to ensure that developments for noise sensitive uses are adequately designed and constructed to protect residential amenity and reduce the potential for land use conflict that may compromise the use of Macquarie Point as a major public event space.

Amendment – 2.12

This amendment replaces the reference to the key drivers and principles of the former masterplan with the Strategic Principles of the reset masterplan. These principles are included in Section 2.2 above.

Amendment 2.13

Insert a new matter for consideration under Clause 32.4 requiring consideration of the impact of proposed use and development on the viability of Macquarie Point as a major public event space.

Amendments – 2.14

These amendments rearrange the spatial application of use provisions to reflect the reset masterplan.

In is not proposed that the amendments translate the same fine grain use arrangements as shown conceptually on the Mona Vision. A relatively pragmatic and flexible approach to the siting and arrangement of uses is considered desirable to accommodate the range of development options that may arise in the future.

Changes to Use Table 32.5.1 for Arts and Institutional Use Area

- Reapplies the three Use Areas as shown below with a replacement Figure 32.1;
- Renames the Commercial and Institutional Use Area 1 to Arts and Institutional;
- Removes Gambling Premises, Hospital Services and Recreational Boating Facility uses from the Use Table at 32.5.1. Those uses are not considered either desirable or practical under the reset masterplan and consequently are now proposed to be prohibited;

- Inserts Light Industry as a discretionary use to allow consideration of small manufacturing or processing uses that will not cause a nuisance and be compatible with the character of the area;
- Moves Passive Recreation from discretionary to an exempt use;
- Inserts Exhibition Centre and Minor Sport and Recreation as Permitted Uses;
- Inserts Commercial Port Operations as a discretionary use to allow for a transition to the working port;
- Removes Recreational Boating Facility as a discretionary use with the effect that is now prohibited within this Art sand Institutional Area; and
- Inserts Major Sport and Recreation, Railway Terminal and Service Industry as discretionary uses. Major Sport and Recreation is already a discretionary Use in the Mixed Use Area under the existing Site Development Plan. It is considered appropriate that such uses can be considered given the intention for Macquarie Point to act as a major public event space.

Changes to Use Table 32.5.2 for Mixed Use Area Amends the Use Table at 32.5.2 to:

- Moves Passive Recreation from discretionary to an exempt use
- Inserts Childcare Centre and Exhibition Centre as a permitted uses;
- Inserts Manufacturing Sales as a Permitted Use in the Goods Shed with that use otherwise remaining discretionary;
- Moves Minor Sport and Recreation from discretionary to permitted and Inserts Major Sport and Recreation as a discretionary use;
- Inserts Light Industry as a Discretionary use for the reasons discussed above under Amendments 2.14;
- Amends the use condition for Car Park to continue the permitted status of a carpark adjacent to the escarpment given the change from Open Space Area to Mixed Use area under replacement Figure 32.1 (currently permitted in the same location);
- Inserts a new Use Condition for Residential Accommodation to make it only permitted in Areas 2.1 and 2.2 of Figure 32.1 where above ground floor level (except for access);
- Removes Recreational Boating Facility on the basis that this Use Area does not have direct access to the water and is therefore not suitable for marinas and the like; and
- Inserts Warehouse as a discretionary use.

Changes to Use Table 32.5.3 for Open Space Use Area Amends the Use Table at 32.5.3 to:

- Removes the reference to the 'Escarpment Park' from the use condition for Car Park in the Open Space Area to reflect the amended spatial application of the use areas under Figure 32.1. (The permitted status for a carpark adjacent to the escarpment is maintained through the amendment to the Car Park use condition included in Amendment 13 above);
- Inserts Car Park as a discretionary use on the condition that the use is underground. The Interim Use Clause under Amendment 2.3 above will allow for the granting of a temporary planning permit for parking on grade; and

Inserts Research and Development Centre as a discretionary use subject to the condition that the use is directly associated with a use in the Arts and Institutional Area. This would allow for the possibility of some connection for a research and development complex between the two Building Areas on either side of the Key Public Space. Any associated development would be outside the permitted building envelopes under Figure 32.3 and subject to the desired future character statements, including the need to preserve important view lines and the central Key Public Space.

Amendment – 2.15

Amend the deemed to comply standard under A1 of Clause 32.6.1 to reflect updated GFAs associated with the uses of the reset masterplan. As discussed in Section 4.4 above, AEC Group have considered the reallocated GFAs in the market impact assessment and conclude that the extent of these uses will not significantly affect the CBD or the activity centre hierarchy.

The reset masterplan has a reduced focus for residential development now including a 15,000m^2 maximum Gross Floor Area within Use Areas 2.1 and 2.2 shown on Figure 32.1 down from 50,000m^2. This limit reflects the shift under the reset masterplan to a more civic focus for the site and to ensure that uses contribute to the interest and activity of the area.

Amendment -2.16

Amend Clause 32.6.2 to apply more generally to Residential and Visitor Accommodation Uses throughout the site in order to protect residential amenity and reduce the potential for land use conflict with the working port and the use of the site as a major public event space.

Amendment – 2.17

Amend A2 of Clause 32.7.2 to:

- remove the reference to the Round House;
- remove the reference to specific roof forms and instead include a floor area threshold of 300m^2, above which the treatment of roofs will be discretionary.

The 300m^2 threshold is considered an appropriate threshold that allows buildings of a smaller scale that will not have significant impact as viewed from elevated areas. It is not considered that an appropriate design outcome can be specified as a Deemed to Comply Standard for buildings over that size. Over this size it is considered preferable that roofs of buildings provide interest and are assessed under the discretionary considerations of the existing P2.

Amendment – 2.18

This amends P1 of Clause 32.7.2 to ensure that buildings sited adjacent to the headland do not protrude above the escarpment when viewed from the Cenotaph.

Amendment – 2.19

This amends A3 of Clause 32.7.2 to ensure that buildings are built within the areas on 32.3 but don't necessarily need to match the shape of the envelopes.

Amendment – 2.20

This amends Clause 32.7.3 and results from a move from the rectilinear form and relatively small lots of the former masterplan and the existing Development Framework under Figure 32.3. Flexibility is provided under the reset masterplan for buildings to be sited within larger Building Areas with a focus on forming the spaces, but not necessarily occupying the entire width of the longer street frontages of these building areas. The Performance Criteria provide for a variation in building shapes provided that the overall impression is of retention of continuous alignment of space.

Amendment – 2.21

Amend Clause 32.7.5 to reflect the updated layout and urban design rationale of the reset masterplan. This Clause currently manages the siting of buildings within the open space area between the northern edge of buildings shown on the Development Framework Figure 32.3 and the foot of the escarpment.

This clause is now amended to apply to buildings along the foot of the escarpment within Use Area 2 on Figure 32.1.

Amendment – 2.22

Amend the Objective and P1 of Clause 32.7.6 a to replace the term interaction with interest in response to a recognition that the civic nature of some buildings mean that it may not be practical in all cases to provide windows in the frontage of a building.

Amendment – 2.23

Amend Clause 32.7.10 as follows:

- A1 – remove the reference to east west as the 6m wide links on Figure 32.3 are no longer only running east west.
- P1 – update the references in part b) to the Strategic Principles in the reset masterplan.

Amendment – 2.24

Amend the Attenuation from the WWTP Clause 32.14.6 to:

- insert a new P1 for consideration of sensitive uses within the 400m
- delete A2 and P2 dealing with non- sensitive uses.

These changes are consistent with the approach under the Attenuation Code of the State Planning Provisions.

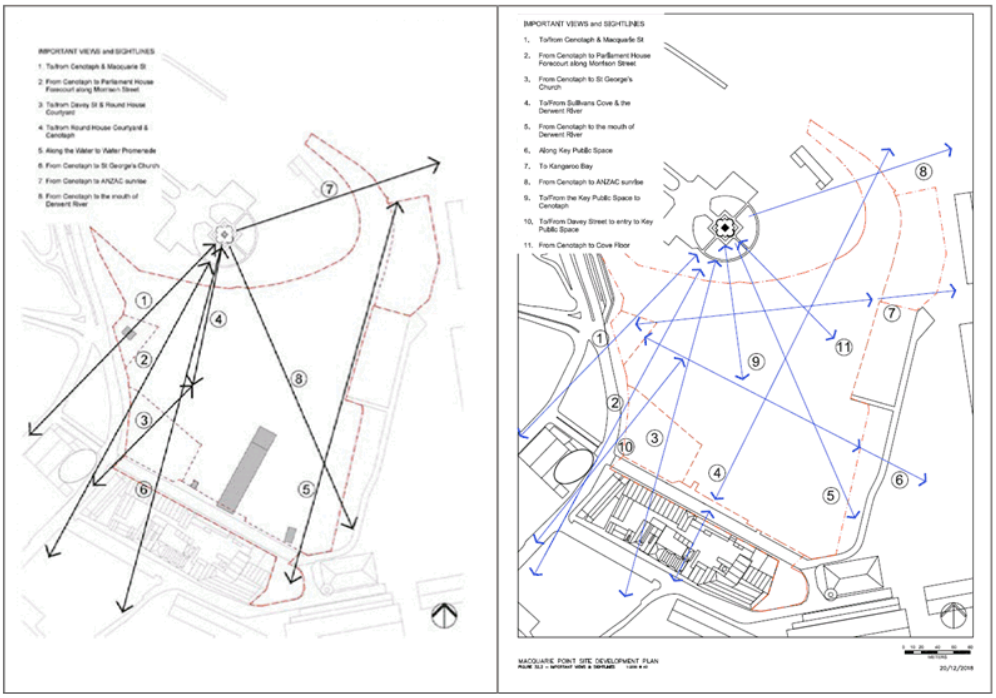
Amendment – 2.25

Update the Use Areas to reflect the reset masterplan by replacing Figure 32.1

Existing Figure 32.1 ***Proposed replacement Figure 32.1***

Amendment – 2.26

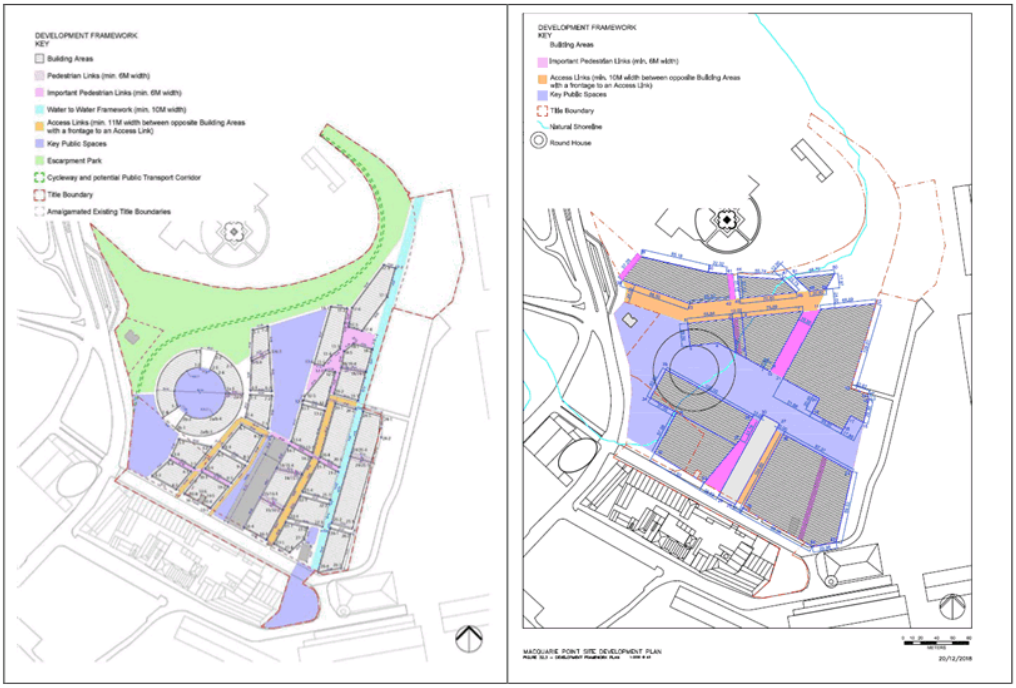
Update the view and sightlines to reflect the reset masterplan by replacing Figure 32.2.



Existing Figure 32.2 ***Proposed replacement Figure 32.2***

Amendment – 2.27

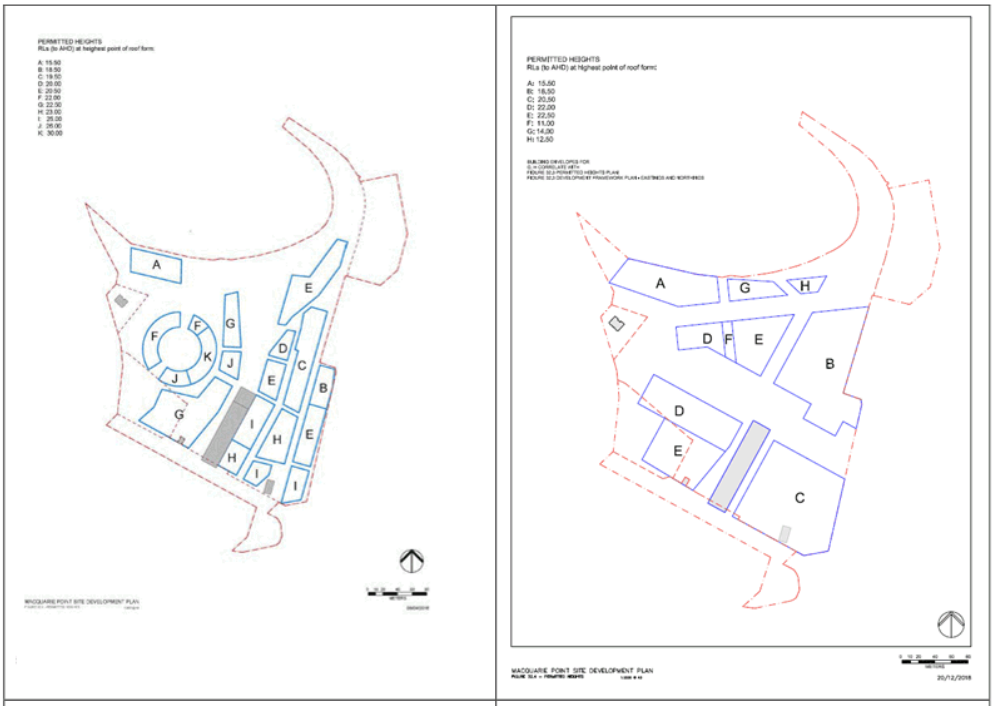
Update the Development Framework to reflect the reset masterplan by replacing Figure 32.3 and associated Table 32.3.



Existing Figure 32.3 ***Proposed replacement Figure 32.3***

Amendment – 2.28

Update the building envelopes and heights as shown on Figure 32.4 with the associated detailed coordinates in Table 32.3 to reflect the reset masterplan. The changes are described in Sections 4.1 and 4.2 above.



Existing Figure 32.4	*Proposed replacement Figure 32.4*

5.4 Impact of the proposed amendments on other parts of the Planning Scheme

The following considers the proposed amendments in the context of the operation of remainder of the Planning Scheme.

Part A – Preliminary

No amendments are required to this Part.

Part B – Sullivans Cove Strategic Framework

This request demonstrates consistency with 5. Values and Strengths of the Cove, 6. Preferred Future for the Cove, 7. Planning Principles for Management of Activities in the Cove.

Part C – Application of the Scheme

No amendments are required to this Part.

Part D – Activity Area Controls

This Part includes the provisions for Activity Area 3 'Sullivans Cove Gateway' under Section 18 that cover the extent of the site but essentially redirect the objectives for activities and use and development of land to the SDP. The proposed amendments do not conflict with or require amendments to this Part.

Schedule 1 – Conservation of Cultural Heritage Values

No amendments are proposed to the listings under this Schedule.

There are 3 listed buildings: Royal Engineers Building, Goods Shed and Red Shed. Buildings and works on these places are to be considered under the provisions for Conservation of Places of Cultural significance under Section 22.4.

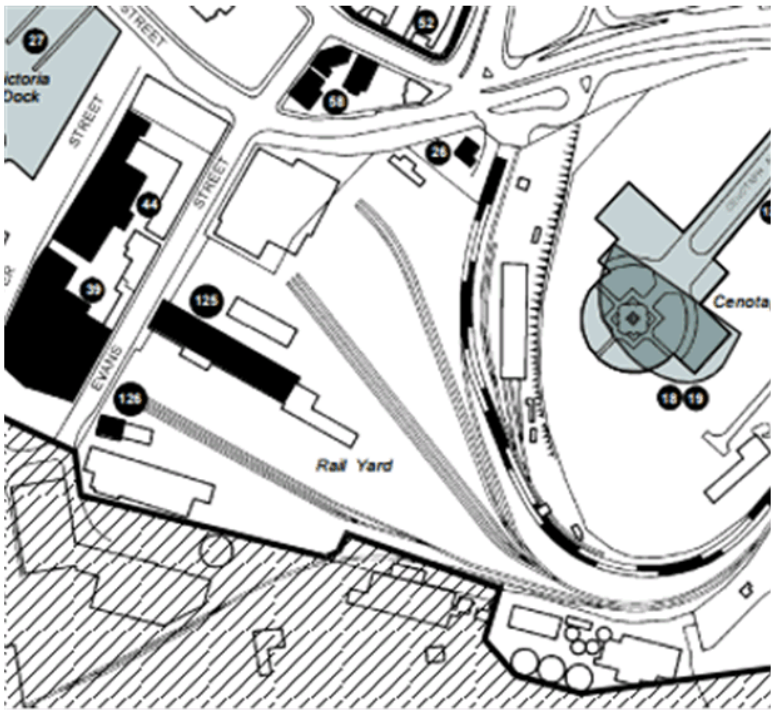


Figure 11 - Places of Cultural Significance (Figure SCPS)

Under Clause 22.5.2, the remainder of the SDP site is exempt from Section 22.5 Building or Works on Land Not included in Table 1.

Buildings and works which involve excavation of land within the 3 listed places or area 12 shown on Figure 5a need to either be supported by:

- A statement by a qualified archaeologist that either the site has been surveyed and not found to be of archaeological significance or that the nature of the 'building and works' will not result in destruction of any aspects of items of archaeological significance (Permitted under Clause 22.6.4) or
- Have regard to the recommendations of an Archaeological Sensitivity Report (Discretionary under 22.6.5)

Figure 12 - Places of Archaeological Sensitivity (Figure 5a SCPS 1997)

Schedule 2 – Urban Form

Buildings within the Site are exempt from this Schedule under Clause 23.4iii. No amendments are required to this Schedule.

Schedule 3 – Public Urban Space

All buildings and works on the Site are exempt from this Schedule under Clause 24.2A. No amendments are required to this Schedule.

Schedule 4 – Signs

The signage provisions of this Schedule will continue to apply to the Site.

No amendments are required to this Schedule.

Schedule 5 – Traffic, Access and Parking

The reset masterplan maintains the same access, parking and movement principles as the former master plan. Some minor amendments are required to the Objectives for Traffic, Access and Parking in Activity Area 3 under Section 26.3 to update feature references to reflect the reset masterplan terms.

Schedule 6 – Subdivision

Under Clause 27.3.1 Subdivision within the 'Macquarie Point Site Development Plan' in clause 32 under Part F of the Scheme is 'exempt' from this schedule.

No Amendments are required to this Schedule.

Schedule 7 – Demolition

Demolition of buildings or works other than the 3 heritage listed places are exempt from this Schedule under Clause 28.4.1.

Under Clause 28.8.2 demolition (including partial demolition) involving a heritage listed place is to be supported by a Conservation Plan or report that the building (part of the building) does not have heritage value.

No amendments are required to this Schedule.

Schedule 8 – Environmental Management

No amendments are required to this Schedule.

Schedule 9 – Telecommunications Infrastructure

No amendments are required to this Schedule.

6. Strategy

6.1 Southern Tasmania Regional Land Use Strategy

The Southern Tasmania Regional Land Use Strategy (Strategy) sets the strategic direction for Southern Tasmania, to facilitate and manage change, growth and development within Southern Tasmania over the next 25 years. The Strategy is considered comprehensively in the Assessment of Market Impacts prepared by AEC Group that was submitted by the Corporation in support of the 2015 Planning Scheme amendments.

The overarching vision for Southern Tasmania in accordance with the Strategy is:

"A vibrant, growing, liveable and attractive region, providing a sustainable lifestyle and development opportunities that build upon our unique natural and heritage assets and our advantage as Australia's southern most region"

The Strategy goes further to define the vision by setting out ten strategic directions to support the vision. Of particular relevance to Macquarie Point are the following strategic directions:

- Strategic Direction 2: Historically Managing Residential Growth;
- Strategic Direction 8: Supporting Strong and Healthy Communities;
- Strategic Direction 9: Making the Region Nationally and Internationally Competitive; and
- Strategic Direction 10: Creating Liveable Communities.

In order to deliver the vision and strategic directions the Strategy defines fourteen regional policies. The strategic directions identified above are tied to each of the regional policies set out below:

- Tourism;
- Strategic Economic Opportunities;
- Activity Centres; and
- Settlement and Residential Development.

Each policy is described below specifically having regard to its relevance to the site.

Tourism

This policy states that tourism has grown substantially in Tasmania in recent years. It notes that land use planning and its outcomes have numerous impacts upon the tourism industry and the degree to which Planning Schemes provide flexibility to ensure that the tourism industry can be innovative and respond to demand and the market. The policy sets out a number of tourism policies. Those of particular relevance are:

- *T1.5 Provide flexibility within commercial and business zones for mixed use developments incorporating tourism related use and development.*
- *T1.6 Recognise, planning schemes may not always be able to accommodate the proposed tourism use and development due to its innovative and responsive nature.*
- *T1.7 Allow for objective site suitability assessment of proposed tourism use and development through existing non-planning scheme based approval processes (43A application).*

The reset masterplan envisages some tourism use to be part of the development i.e. hotel, retail and as the policy highlights, flexible zoning controls are important for mixed use developments which contain tourism uses.

Strategic Economic Opportunities

This policy recognises that Southern Tasmania is well placed to take advantage of its location, size, accessibility, and its history as a hub for research, creativity and learning. The policy sets out the following:

- *SEO 1.1 Protect the following key sites and areas from use and development which would compromise their strategic economic potential through planning scheme provisions: a) Hobart Port (including Macquarie and Princes Wharves) b) Macquarie Point rail yards; and c) Princes of Wales Bay marine industry precinct;*
- *SEO 1.2 Include place specific provisions for the Sullivans Cove area in the planning scheme.*

In line with the policy, the reset masterplan and amendments to the SDP have been prepared with a particular emphasis on the unique qualities of the site, revealing its history, its strategic potential as a mixed-use precinct and protecting the operation of the Port of Hobart.

Activity Centres

The policy states that Activity Centres provide the focus for services, employment, and social interaction in cities and towns. They provide a broader function than just retail and commercial centres. They are also community meeting places, centres of community and government services etc. The policy sets out an Activity Centres Network noting the 'pre-eminence' of the Hobart CBD as the centre for public administration, financial services and commerce for the region and the State as a whole.

Settlement and Residential Development

This policy states the importance of the location, form, type and density of residential development. The policies of relevance include:

- *SRD.1 Provide a sustainable and compact network of settlements with Greater Hobart at its core that is capable of meeting projected demand.*
- *SRD 1.5 Ensure land zoned residential is developed at a minimum of 15 dwellings per hectare (net density).*
- *SRD.2 Manage residential growth for Greater Hobart on a whole of settlement basis and in a manner that balances the needs for greater sustainability, housing choice and affordability.*

- *SRD 2.1 Ensure residential growth for Greater Hobart occurs through 50% infill development and 50% greenfield development.*
- *SRD 2.7 Distribute residential infill growth across the existing urban areas for the 25 year planning period:*
  - *Glenorchy LGA - 40% (5,300 dwellings);*
  - *Hobart LGA - 25% (3,312 dwellings);*
  - *Clarence LGA - 15% (1,987 dwelling);*
  - *Brighton LGA - 15% (1,987 dwellings); and*
  - *Kingborough LGA - 5% (662 dwellings).*
- *SRD 2.9 Encourage a greater mix of residential dwelling types across the area with a particular focus on dwelling types that will provide for demographic change including an ageing population.*

The reset masterplan provides a greater civic or public use focus for the site. It places less emphasis on residential use and development opportunities on the site. It is considered that the improved civic amenity offered by the development of Macquarie Point will continue to support inner city living and urban consolidation in and around Hobart's CBD.

6.2 Hobart 2025 Strategic Framework

The Hobart 2025 Strategic Framework (Strategic Framework) sets the strategic direction for Hobart to 2019, its overarching vision is that it:

- *offers opportunities for all ages and a city for life;*
- *is recognised for its natural beauty and quality of environment;*
- *is well governed at a regional and community levels;*
- *achieves good quality development and urban management;*
- *is highly accessible through efficient transport options;*
- *builds strong and healthy communities through diversity, participation and empathy; and*
- *is dynamic, vibrant and culturally expressive.*

The Strategic Framework sets out seven Future Direction Areas and associated desired outcomes listed below that can be furthered through the development of Macquarie Point:

FD1 – offers opportunities for all ages and a city for life

- *FD1.1. Opportunities for education, employment and fulfilling careers and retaining young people*
- *FD1.2. Lifestyle that will encourage all ages to see the city as a desirable location and lifelong home*

FD2 – is recognised for its natural beauty and quality of environment

- *FD2.1. The natural beauty of Mount Wellington, the Derwent River, bushland surrounds and foreshore locations is highly valued.*
- *FD2.2. Community connection to the natural environment through the protection of views, vistas, access and linkages is enhanced.*

- *FD2.3. The physical environment has been conserved in a way that ensures we have a healthy and attractive city.*
- *FD2.4. Better understanding of climate change and its potential effect on the natural and built environment and strategies developed.*

FD3 – is well governed at a regional and community level

- *FD3.1. An integrated approach to the planning and development of the wider metropolitan region.*
- *FD3.2. Partnerships with governments, the private sector and local communities in achieving significant regional, city and community goals.*
- *FD3.3. Development of technologies that give young people opportunities to contribute to planning and development in the city*

FD4 – achieves good quality development and urban managementFD4.1. The city remains unique in its own right, protecting its built heritage and history.

- *FD4.2. Quality development with the principles of sustainable cities and the reduction of ecological impacts pursued.*
- *FD4.3. Access to the waterfront, foreshores, public and open spaces is valued.*
- *FD4.4. The city continues to enjoy the benefits of scale and proximity*

FD5 – is highly accessible through efficient transport systems

- *FD5.1. Convenience and accessibility through the greater use of transport alternatives and an effective road and travel network.*
- *FD5.2. An integrated approach to transport planning within the city and across the wider metropolitan region.*

FD6 – builds strong and healthy communities through diversity, participation and empathy

- *FD6.1. A spirit of community.*
- *FD6.2. Diversity is valued and there is participation by all in their community.*
- *FD6.3. A friendly and compassionate society.*
- *FD6.4. A safe and healthy city.*

FD7 – is dynamic, vibrant and culturally expressive

- *FD7.1. A destination of choice and a place for business.*
- *FD7.2. Clever thinking and support for creativity will help build a strong economic foundation.*
- *FD7.3. Entertainment, arts and cultural activities promote the distinctive character of the city and lifestyle opportunities, and strong communities will ensure a vibrancy and way of life that is Hobart.*

6.3 Public Spaces and Public Life – A City with People in Mind, Gehl Architects

The objective of the study was to create a stronger coherence between the life in the city and planned or existing building structures. The study made the following recommendations with regard to the development of the Macquarie Point site:

Supplement to the city

- *investigate how Hobart Railyards can supplement Hobart.*

- *what is Hobart lacking at the moment?*
- *how can Hobart Railyards be a valuable addition to the existing and what special qualities should it hold?*
- *links with the surroundings.*
- *ensure strong connections with the rest of the city centre and Queens Domain.*
- *walking, cycling and transport links are of high importance.*
- *ensure a high level of continuation of existing street grids and urban pattern.*
- *improve Evans Street and Davey Street as important interfaces and links to the city.*
- *given the extraordinary location of Hobart Railyards, the waterfront should be celebrated by an urban formulated public space relating to its highly urban situation.*

Multifunctional mix of use

The buildings at the Macquarie Point site ought to hold a multifunctional mix of use, within the buildings and within the individual quarters;

- *ensure passive surveillance by placing residences low and in close contact with public space;*
- *build low and dense and avoid tall buildings creating problems at the micro-climatic level.*

The proposed mix of uses, reduced building envelopes, public spaces and connectivity with the CBD under the reset masterplan and the proposed amendments are highly consistent with these objectives.

7. Land Use Planning and Approvals Act 1993

7.1 Land Use Conflicts

The proposal as far as practicable avoids the potential for land use conflicts with use and development permissible under the Planning Scheme applying to the adjacent area. The three pertinent issues are the interface with the working port, the potential for environmental harm to surrounding uses from the WWTP and the potential for land use conflict between residential and visitor accommodation uses and the use of Macquarie Point for major public events.

The port interface

As a working port, the Macquarie Point Wharves precinct of the Port of Hobart generates a number of typical external impacts from day-to-day operations such as: loading and unloading vessels, warehousing operations, general cargo handling equipment and from operational movements through the port precinct from heavy vehicles. Impacts include air emissions, noise (and vibration), dust, waste, truck traffic, lighting, handling of dangerous goods risks and typical bio-security risks from overseas commercial vessels.

The proposed amendments maintain the provisions of the Planning Scheme that manage the port interface and ensure that future use and development does not compromise the operation of the Port of Hobart. To protect the operations of the port the non-sensitive use buffer of the Arts and Institutional Activity Area (existing Commercial and Institutional Area) will be maintained and Desired Future Character Statements are included in the SDP at clause 32.3.5, along with standards at clauses 32.6.2 and 32.7.1 for both sensitive and non-sensitive uses in specific areas along, or in close proximity to, the port boundary.

The SDP also includes a number of 'Matters to be Considered' at clause 32.4 to allow conditions to be imposed on use and development in certain circumstances, where the Council must consider:

- *The suitability of proposed development to achieve satisfactory levels of safety and amenity of occupants including the avoidance of vulnerability to noise, air, vibration and lighting impacts from the Port of Hobart;*
- *The impact on the operation of the Port of Hobart;*
- *Protection of public infrastructure and the environment;*

The reset masterplan will not alter the port protection measures under the existing Planning Scheme.

WWTP

It is proposed to amend clause 32.14.6 to remove the considerations for non sensitive uses.

As discussed in Section 4.6 above, the existing Clause 32.14.6 was determined by the TPC based on evidence before it at the time of the hearings for the 2/2015 Amendments in 2016. At that time all evidence was on a 'desktop basis' only.

Subject to Dr Carter's report the Minister can be satisfied that the proposed amendments to Clause 32.14.6 will as far as practicable, avoid the potential for land use conflicts between the WWTP, while it continues to operate, and the use and development permissible under the Planning Scheme.

Residential use and major public events

The proposal includes a new matter for consideration under Clause 32.4 and amendments to Clause 32.6.2 requiring residential and visitor accommodation development to be designd and constructed to achieve a minimum reduction in sound pressure level between the exterior of the building and the bedroom or living room. The design targets in 32.6.2 have been drafted with reference to similar provisions for an entertainment zone in the Fortitude Valley Neighbourhood Plan, Brisbane City Council, 2000.

7.2 Impact of the Amendment on the Region as an Entity

The proposed amendments reset the spatial arrangement of mixed use redevelopment of the site and will have an overwhelmingly positive impact on the Hobart CBD, and Southern Tasmania in general. These considerations are assessed in the updated market impact statement prepared by ACE Group.

7.3 State Policies

The following State Policies are made under the State Policies and Projects Act 1993:

- State Policy on the Protection of Agricultural Land 2009;
- State Policy on Water Quality Management 1997; and
- Tasmanian State Coastal Policy 1996.

The National Environmental Protection Measures are automatically adopted as State Policies under the State Policies and Projects Act 1993.

- State Policy on the Protection of Agricultural Land 2009;
- State Policy on Water Quality Management 1997;
- Tasmanian State Coastal Policy 1996; and
- National Environmental Protection Measures (NEPMS).

The following section examines the State Policies as they apply to this amendment.

7.3.1 State Policy on the Protection of Agricultural Land 2009

The purpose of the State Policy on the Protection of Agricultural Land 2009 is:

"to conserve and protect agricultural land so that it remains available for the sustainable development of agriculture, recognising the particular importance of prime agricultural land".

Comment

This Policy is not relevant to the proposal.

7.3.2 State Coastal Policy 1996

The following desired Outcomes of the State Coastal Policy 1996 are considered most relevant to the proposed amendments:

Coastal Uses and Development

2.1.4. Competing demands for use and development in the coastal zone will be resolved by relevant statutory bodies and processes, in particular the Land Use Planning Review Panel, the Resource Management and Planning Appeal Tribunal and the Marine Farming Planning Review Panel. Planning schemes, marine farming development plans and other statutory plans will provide guidance for resource allocation and development in accordance with this Policy.

Transport

2.5.5. The multiple use of port areas will be encouraged but priority will be given to efficient port operations and safety requirements subject to cultural, natural and aesthetic values not being compromised.

Comment

The reset masterplan relates to Stage 1 of the Tasmanian Government's reset and does not involve port land. As discussed above the amendments maintain the port protection measures of the existing Planning Scheme and will prioritise efficient port operations and safety requirements while also being respectful of cultural, natural and aesthetic values.

The proposal is considered consistent with these Outcomes and the State Coastal Policy.

7.3.1 State Policy on Water Quality Management 1997

The State Policy on Water Quality Management is concerned with achieving *'sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of Tasmania's Resource management and Planning System'.*

Comment:

The proposed amendments continue to allow for suitable stormwater treatment to be incorporated in future development as required by the Planning Scheme and as described in the accompanying updated infrastructure assessment prepared by Pitt & Sherry. Such measures will ensure the long-term quality of stormwater runoff is efficiently managed to protect water quality in accordance with this Policy.

7.4 National Environment Protection Measures

The National Environmental Protection Measures relate to:

- ambient air quality;
- ambient marine, estuarine and fresh water quality;

- protection of amenity in relation to noise;
- general guidelines for assessment of site contamination;
- environmental impacts associated with hazardous wastes; and
- re-use and recycling of used materials.

Comment:

The proposal maintains the existing Environmental Management provisions under section 32.14 of the SDP and Schedule 8 of the Planning Scheme to manage emissions and water quality consistent with the above Measures as far as they are relevant.

7.5 Southern Tasmania Regional Land Use Strategy

The Southern Tasmania Land Use Strategy 2010-2035 (STRLUS) sets the strategic direction for southern Tasmania and espouses various policies to achieve its strategic objectives. The implications of the STRLUS have been considered in the accompanying assessment of market impacts prepared by AEC Group.

The proposed amendments are consistent with these objectives and policies in the following respects:

- They will implement an updated master plan for the site that has been prepared with regard to issues of urban amenity, economic development, accessibility, urban design and pedestrian movement;
- tourism land uses will continue to be incorporated as permitted uses;
- the historical significance of the Site is emphasised through the protection of the Goods Shed, Red Shed, Royal Engineers building and setting of the Cenotaph through the Cultural Heritage Schedule and proposed siting and height standards, as well as identification of the original shoreline and railway Round House through the Development Framework;
- there will be some potential for residential use to contribute to overall housing diversity and residential infill targets in Hobart;
- development of the site under the amended SDP will continue to contribute to improving Hobart's international relations and recognition, in line with the Hobart Strategic Plan (2014-2019);
- the reset masterplan configuration will strengthen connections with the Hobart CBD as the primary activity area for Tasmania, the region and the Greater Hobart metropolitan area in terms of business, leisure, entertainment and tourism services.

Schedule 1of the Land Use Planning & Approvals Act 1993

The Minister must be satisfied that the proposal furthers the requirements of the Objectives set out in Schedule 1 of the Land Use Planning and Approvals Act 1993. The objectives in Schedule 1 and their relevance to this amendment are addressed below.

7.5.1 Schedule 1 Part 1

(a) To promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity;

Comment

The amendment promotes the objectives for sustainable development of land through careful design and implementation of an agreed objective for a mixed use precinct at this location that will support the environmental benefits of urban consolidation and multi-modal transport accessibility. The environmental management provisions of the Planning Scheme will continue to apply.

(b) To provide for the fair, orderly and sustainable use and development of air, land and water;

Comment

The site has been identified by the existing and previous Governments for redevelopment as a mixed use precinct in accordance with the requirements of the MPDC Act. The proposed rearrangement of the layout of the existing SDP is supported by analysis and consideration of strategic implications including impacts on the CBD and Port of Hobart. The proposal is considered to be entirely consistent with this objective.

(c) To encourage public involvement in resource management and planning;

Comment

Following the public release and Government endorsement of the Mona's Vision, the Corporation has actively engaged with close to 20 consultative groups across a range of stakeholders at each stage of the reset to provide opportunities for input in the preparation of the reset masterplan. The proposed planning scheme amendment process will include further opportunities for public participation.

(d) To facilitate economic development in accordance with the objectives set out in paragraphs (a), (b) and (c) above.

Comment

For the reasons set out above and throughout this report and accompanying assessments, the proposal is considered consistent with these objectives.

(e) To promote sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

Comment

The proposed reset masterplan has been prepared in consultation with State Agencies, utility providers, Council and industry and supports the attainment of this objective.

7.5.2 Schedule1 Part 2

(a) To require sound strategic planning and co-ordinated by state and local Government;

Comment

The proposal is consistent with the relevant land use strategies.

(b) To establish a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land;

Comment

The SDP will continue to manage future use and development on this site and is consistent with this objective.

(c) To ensure the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use and development of land;

Comment

The environmental values of the land and the potential impacts of development under the reset masterplan have been assessed in detail as set out throughout this report and accompanying assessments.

(d) To require land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional, and municipal levels;

Comment

The development of Macquarie Point under the reset masterplan will continue to represent a significant social, environmental and economic benefit at both the local and State levels and is consistent with this objective.

(e) To provide for the consolidation of approvals for land use or development and related matters, and to co-ordinate planning approvals with related approvals;

Comment

The proposal does not conflict with this objective.

(f) To secure a pleasant, efficient and safe working, living and recreational environment for all Tasmanians and visitors to Tasmania;

Comment

The reset masterplan aims to create a high quality environment in a landscaped setting of exceptional amenity within close proximity to surrounding services.

(g) To conserve those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value;

Comment

The amendments maintain the heritage listing and protection considerations under Schedule 1 of the Planning Scheme. The amended building envelopes will reduce the height and massing allowed under the existing SDP and will therefore have a lesser impact on the context of existing heritage features.

(h) To protect public infrastructure and other assets and enable the orderly provision and co-ordination of public utilities and other facilities for the benefit of the community;

Comment

The amendment is supported by updated analysis by Pitt & Sherry that confirms the capacity of current infrastructure and utilities to cater to the predicted development.

(i) To provide a planning framework which fully considers land capability;

Comment

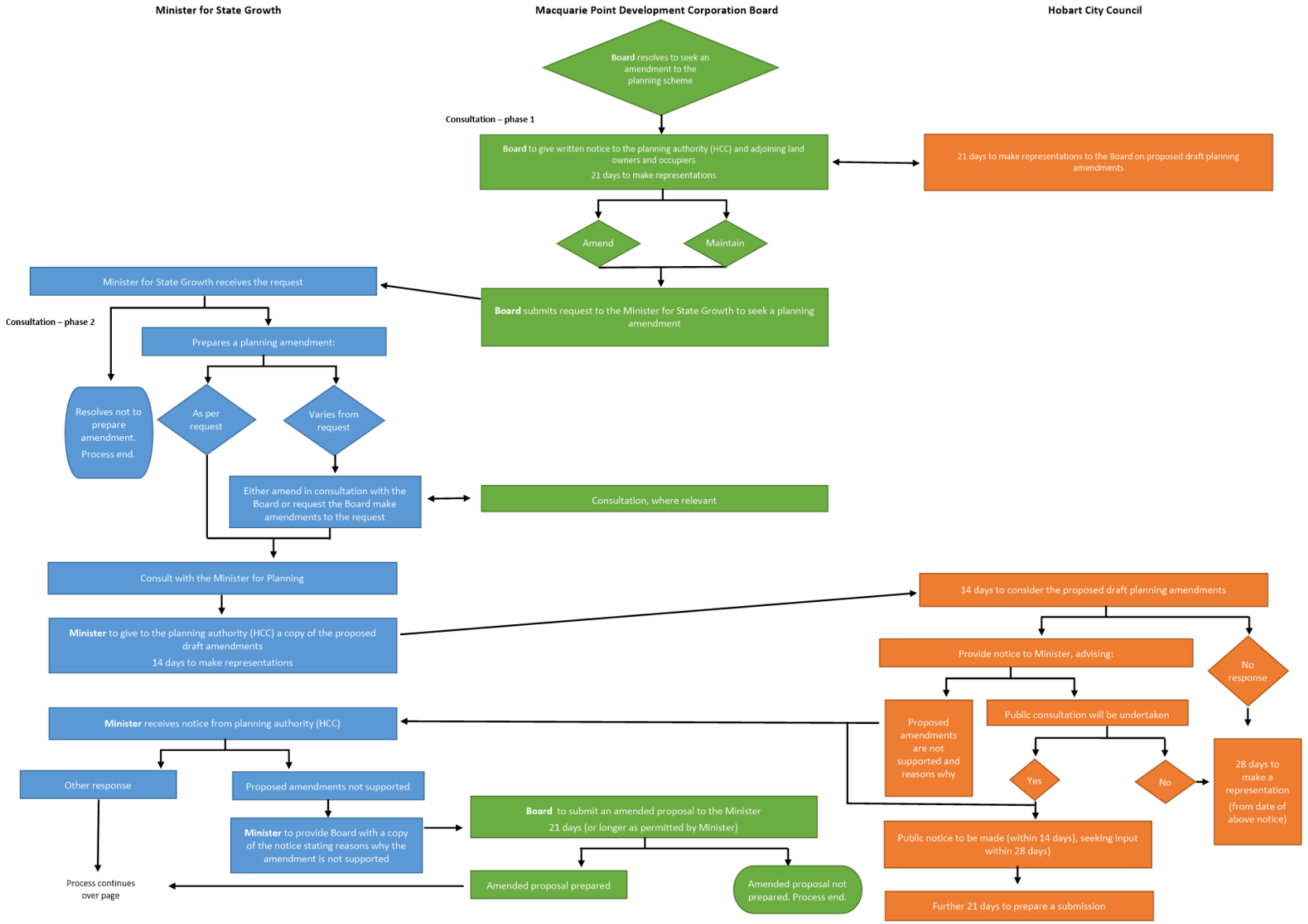
The proposal does not conflict with the attainment of this objective.

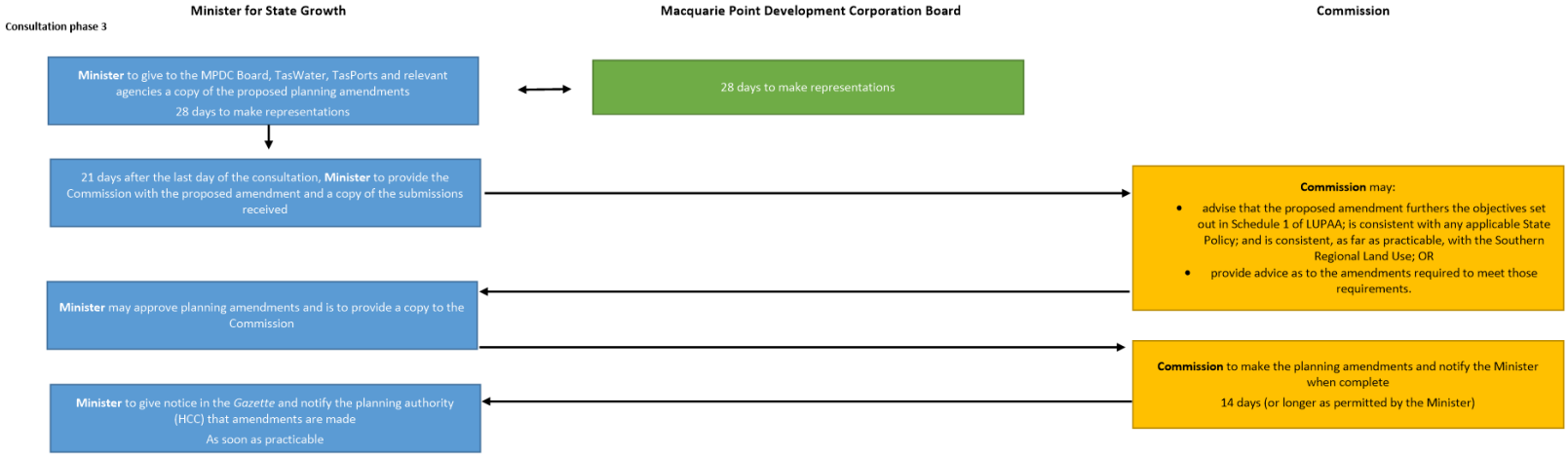
Conclusion

The proposed amendments translate the reset masterplan as amendments to the Macquarie Point Site Development Plan under Section 32 of the Planning Scheme.

This assessment demonstrates that the proposed amendments remain consistent with the strategic principles of the Sullivans Cove Planning Scheme 1997 and meet all statutory requirements under the former provisions of LUPAA and the MPDC Act.

Appendix A
Draft Amendment


Minister for State Growth
Macquarie Point Development Corporation Board
Hobart City Council
Board resolves to seek an amendment to the planning scheme
Consultation – phase 1
Board to give written notice to the planning authority (HCC) and adjoining land owners and occupiers
21 days to make representations
21 days to make representations to the Board on proposed draft planning amendments
Amend
Maintain
Minister for State Growth receives the request
Board submits request to the Minister for State Growth to seek a planning amendment
Consultation – phase 2
Prepares a planning amendment:
Resolves not to prepare amendment.
Process end.
As per request
Varies from request
Either amend in consultation with the Board or request the Board make amendments to the request
Consultation, where relevant
Consult with the Minister for Planning
Minister to give to the planning authority (HCC) a copy of the proposed draft amendments
14 days to make representations
14 days to consider the proposed draft planning amendments
Provide notice to Minister, advising:
No response
Minister receives notice from planning authority (HCC)
Proposed amendments are not supported and reasons why
Public consultation will be undertaken
Yes
No
28 days to make a representation (from date of above notice)
Other response
Proposed amendments not supported
Minister to provide Board with a copy of the notice stating reasons why the amendment is not supported
Board to submit an amended proposal to the Minister
21 days (or longer as permitted by Minister)
Public notice to be made (within 14 days), seeking input within 28 days)
Process continues over page
Amended proposal prepared
Amended proposal not prepared. Process end.
Further 21 days to prepare a submission


Minister for State Growth
Macquarie Point Development Corporation Board
Commission
Consultation phase 3
Minister to give to the MPDC Board, TasWater, TasPorts and relevant agencies a copy of the proposed planning amendments
28 days to make representations
28 days to make representations
21 days after the last day of the consultation, Minister to provide the Commission with the proposed amendment and a copy of the submissions received
Commission may:
advise that the proposed amendment furthers the objectives set out in Schedule 1 of LUPAA; is consistent with any applicable State Policy; and is consistent, as far as practicable, with the Southern Regional Land Use; OR
provide advice as to the amendments required to meet those requirements.
Minister may approve planning amendments and is to provide a copy to the Commission
Commission to make the planning amendments and notify the Minister when complete
14 days (or longer as permitted by the Minister)
Minister to give notice in the Gazette and notify the planning authority (HCC) that amendments are made
As soon as practicable

Results: Document Types="*Acts*", Search In="*Title*", All Words="*macquarie*", Point In Time="*03/01/2019*" match 96 of 96 provisions

Macquarie Point Development Corporation Act 2012

Version current from 17 December 2018 to date (accessed 3 January 2019 at 8:47)

Division 3 - Planning

39G. Corporation may request Minister to prepare proposed amendments to planning scheme

(1) The Board, by notice to the Minister, may request the Minister to prepare, in accordance with a draft, of the proposed amendments to the planning scheme, attached to the request –

(a) proposed amendments to the relevant planning scheme that are to apply to the area of land that is within the site on the day on which this section commences; or

(b) proposed amendments to the relevant planning scheme that are to apply to an area of land that is within the site but was not within the site on the day on which this section commences.

(2) The Board may only issue –

(a) one request under subsection (1) for the purposes of subsection (1)(a) ; and

(b) one request under subsection (1) for the purposes of subsection (1)(b) in relation to each area of land that is within the site but was not within the site on the day on which this section commences.

(3) If the Board intends to make a request to the Minister under subsection (1) , the Board must give to the relevant planning scheme planning authority, and the owners and occupiers of each area of land, any part of which adjoins the site, a notice –

(a) specifying that the Board intends to make a request to the Minister under subsection (1) ; and

(b) including a copy of the draft, of the proposed amendments to the planning scheme, that it intends to attach to the request under subsection (1) ; and

(c) inviting the authority, owner and occupiers to make, under subsection (4) , within 21 days, representations in relation to the intended request and the draft referred to in paragraph (b) .

(4) The relevant planning scheme planning authority and those owners and occupiers to whom a notice has been given under subsection (3) may, within 21 days, make representations to the Board in relation to the request, and the copy of the draft, included in the notice in accordance with subsection (3)(b) .

(5) Without limiting the generality of subsection (4) , a representation made under that subsection by the relevant planning scheme planning authority may include –

(a) a statement that the authority does not support the proposed request or draft; and

(b) a statement of the amendments that would need to be made to the request and the draft in order for the authority to support them.

(6) If one or more representations have been made under subsection (4) in relation to a request and a draft of amendments, the Board must, after the last day on which a representation may be made under that subsection –

(a) consider the representations; and

(b) determine whether or not to amend the proposed request and the draft of the amendments so as to take into account any of the representations.

(7) If the Board determines under subsection (6)(b) to amend the proposed request and the draft of the amendments so as to take into account a representation made under subsection (4) –

(a) the Board may amend the proposed request and the draft of the amendments so as to take into account the representation; and

(b) the Board may submit to the Minister under subsection (1) the request, as so amended, and the draft of the amendments, as so amended; and

(c) subsection (3) does not apply in relation to the request and the draft of the amendments.

(8) A request under subsection (1) is to include –

(a) a statement as to the consultation that the Board has undertaken in relation to the draft of the proposed amendments to the relevant planning scheme; and

(b) a statement setting out how the draft of the proposed amendments to the relevant planning scheme –

(i) furthers the requirements of the objectives set out in Schedule 1 to the Land Use Planning and Approvals Act 1993 ; and

(ii) is consistent with any applicable State Policy within the meaning of the State Policies and Projects Act 1993 ; and

(iii) is, as far as practicable, consistent with the Southern Regional Land Use Strategy made under the Land Use Planning and Approvals Act 1993 .

39H. Preparation of proposed amendments

(1) The Minister, after receiving a request under section 39G(1) containing a draft of proposed amendments to the relevant planning scheme, must –

(a) prepare proposed amendments to the relevant planning scheme in the form of the draft of the proposed amendments to the relevant planning scheme to which the request relates; or

(b) after consultation with the Board, prepare proposed amendments to the relevant planning scheme in the form of the draft of the proposed amendments to the relevant planning scheme to which the request relates, altered by the Minister as the Minister thinks fit; or

(c) require the Board to amend, in accordance with the requirement, the draft of the proposed amendments to the relevant planning scheme to which the request relates and make a new request under section 39G(1) in relation to the proposed amendments as amended in accordance with the requirement; or

(d) refuse to prepare proposed amendments to the relevant planning scheme.

(2) The Minister must consult with the Planning Minister in preparing under subsection (1) proposed amendments to the relevant planning scheme.

(3) After preparing under subsection (1) proposed amendments to the relevant planning scheme and before complying with subsection (11) , the Minister must provide to the relevant planning scheme planning authority a notice –

(a) containing a copy of the proposed amendments to the relevant planning scheme; and

(b) requesting the authority to give to the Minister, within 14 days, a notice under subsection (4) in relation to the proposed amendments; and

(c) specifying that, if the authority does not give to the Minister a notice under subsection (4)(a) or (c) , the authority may, within 28 days after receiving the notice from

the Minister, make representations in relation to the proposed amendments.

(4) The relevant planning scheme planning authority must, within 14 days after receiving a notice under subsection (3) in relation to the proposed amendments, give to the Minister –

(a) a notice specifying that the authority intends to seek representations from the public in relation to the proposed amendments; or

(b) a notice specifying that the authority does not intend to seek representations from the public in relation to the proposed amendments; or

(c) a notice specifying –

(i) why the authority does not support the proposed amendments; and

(ii) a statement of the amendments that would need to be made to the proposed amendments in order for the authority to support them.

(5) If the relevant planning scheme planning authority gives to the Minister a notice under subsection (4)(b) , the authority may, within 28 days after receiving the notice from the Minister, make representations to the Minister in relation to the proposed amendments.

(6) If the relevant planning scheme planning authority gives to the Minister a notice under subsection (4)(a) , the planning authority must –

(a) within 14 days, cause a consultation notice in accordance with subsection (7) to be published in a newspaper published in, and circulating generally in, the State; and

(b) cause a copy of the proposed amendments to be made available for viewing by the public at the offices of the authority and at an electronic address of the authority.

(7) A consultation notice in relation to proposed amendments is to –

(a) invite persons and bodies to make, within 28 days after a date, specified in the notice, that is after the date on which the notice is published under subsection (6) , representations, to the relevant planning scheme planning authority, in relation to the proposed amendments; and

(b) specify the address of the offices of the authority, and the electronic address of the authority, at which the proposed amendments are available for viewing; and

(c) specify the address, and an electronic address, at which any representations under subsection (8) may be lodged.

(8) A person or body (other than the relevant planning scheme planning authority) may, if a notice has been published under subsection (6)(a) in relation to the proposed amendments, make to the relevant planning scheme planning authority, within 28 days after the notice is published, representations in relation to the proposed amendments by lodging them at an address specified in the notice.

(9) If the Minister receives a notice under subsection (4)(c) in relation to the proposed amendments –

(a) the Minister must provide a copy of the notice to the Board; and

(b) the Minister must notify the Board that, if the Board does not take action under subsection (10) in relation to the request to which the proposed amendments relate, the request will be taken to have never been made; and

(c) if the Board does not provide to the Minister an amended request and amended draft under subsection (10) within 21 days or a longer period allowed by the Minister, the request under subsection (1) is to be taken to have never been made; and

(d) if the Board provides to the Minister an amended request and amended draft under subsection (10) –

(i) the request and draft of the proposed amendments are to be taken to be the first request and draft prepared under section 39G(1) ; and

(ii) the requirements of section 39G are to be taken to have been satisfied in relation to the request and the draft of the proposed amendments; and

(iii) subsection (1) applies in relation to the request and the draft of the proposed amendments.

(10) If the Board receives a notice from the Minister under subsection (9)(b) in relation to a request and the draft of the proposed amendments prepared by the Board under section 39G to which the request relates, the Board may, within 21 days, or a longer period allowed by the Minister, provide to the Minister a copy of the request, and the draft, that the Board has amended in accordance with the statement set out in the notice under subsection (4)(c) in relation to the proposed amendments.

(11) After preparing under subsection (1) proposed amendments to the relevant planning scheme and receiving from the relevant planning scheme planning authority a notice under subsection (4) and before approving the amendments under section 39I(1) , the Minister must provide a notice specifying that the amendments have been prepared, and a copy of the proposed amendments, to –

(a) the Board; and

(b) each relevant statutory authority; and

(c) any Agency that the Minister considers has an interest in the proposed amendments to the relevant planning scheme.

(12) A notice for the purposes of subsection (11) in relation to proposed amendments is to invite the persons or bodies to whom the notice is provided to make to the Minister, within 28 days, representations in relation to the proposed amendments.

(13) A person or body to which a notice under subsection (11) has been provided may make to the Minister, within 28 days after the notice is provided, representations in relation to the proposed amendments.

(14) If a notice has been published under subsection (6)(a) in relation to the proposed amendments, the relevant planning scheme planning authority must, within 21 days after the last day on which a representation may be made under subsection (8) in relation to the proposed amendments, provide to the Minister –

(a) a copy of all representations received by the authority in relation to the proposed amendments; and

(b) a copy of the authority's opinion in relation to the representations; and

(c) a copy of any representations the authority wishes to make in relation to the proposed amendments.

(15) The Minister must, within 21 days after either the last day on which a representation may be made under subsection (13) or, in a case to which subsection (14) applies, the day on which the Minister receives copies of representations under subsection (14) , whichever is the later day, provide to the Commission –

(a) a copy of the proposed amendments; and

(b) if the Minister is considering approving under section 39I(1) a copy of the proposed amendments in the form of the proposed amendments altered as the Minister thinks fit – a copy of the proposed amendments as so altered; and

(c) a copy of all the representations made in relation to the proposed amendments; and

(d) a notice requesting the Commission to provide to the Minister a notice under subsection (16) in relation to the proposed amendments, if any, provided to the

Commission under paragraph (b) .

(16) The Commission, within 21 days after receiving a notice from the Minister under subsection (15)(d) , may, by notice to the Minister –

(a) advise the Minister that, in the opinion of the Commission, the requirements of section 39G(8)(b)(i), (ii) and (iii) have been –

(i) satisfied in relation to the draft of the proposed amendments to the relevant planning scheme; or

(ii) if a copy of the proposed amendments is provided to the Commission under subsection (15)(b) – satisfied in relation to those proposed amendments; or

(b) provide to the Minister the amendments that, in the opinion of the Commission, are required to be made –

(i) to the draft of the proposed amendments to the relevant planning scheme; or

(ii) if a copy of the proposed amendments is provided to the Commission under subsection (15)(b) – to those proposed amendments –

in order for the requirements specified in section 39G(8)(b)(i), (ii) and (iii) to be satisfied in relation to the proposed amendments, and the reasons why the Commission is of that opinion.

39I. Approval of proposed amendments to relevant planning scheme

(1) The Minister, after considering all representations made under section 39H(5) , (13) or (14)(c) and after altering the proposed amendments in accordance with the amendments, if any, of the Commission provided to the Minister under section 39H(16)(b) , may –

(a) approve proposed amendments to the relevant planning scheme that are to apply to the area of land that is within the site on the day on which section 39G commences; or

(b) approve proposed amendments to the relevant planning scheme that are to apply to the area of land that is within the site but was not within the site on the day on which section 39G commences; or

(c) refuse to approve proposed amendments to the relevant planning scheme.

(2) The proposed amendments to the relevant planning scheme that are approved under subsection (1) are to be –

(a) in the form of the proposed amendments to which the notice under section 39H(11) relates; or

(b) after consultation with the Board, in the form, of the proposed amendments to which the notice under section 39H(11) relates, altered as the Minister thinks fit.

(3) As soon as practicable after approving under subsection (1) proposed amendments to the relevant planning scheme, the Minister must provide to the Commission –

(a) a copy of the approval; and

(b) a copy of the proposed amendments to the relevant planning scheme to which the approval relates; and

(c) a statement setting out how the proposed amendments to the relevant planning scheme –

(i) further the requirements of the objectives set out in Schedule 1 to the Land Use Planning and Approvals Act 1993 ; and

(ii) are consistent with any applicable State Policy within the meaning of the State Policies and Projects Act 1993 ; and

(iii) are, as far as practicable, consistent with the Southern Regional Land Use Strategy made under the Land Use Planning and Approvals Act 1993 ; and

(d) a direction to the Commission to make the proposed amendments to the relevant planning scheme and publish, in the manner that the Commission thinks fit, the statement referred to in paragraph (c) .

39J. Commission to amend relevant planning scheme

(1) Within 14 days, or a longer period approved by the Minister, after the Commission receives under section 39I(3)(d) a direction to make proposed amendments to the relevant planning scheme, the Commission must –

(a) prepare amendments to the relevant planning scheme in the form of the proposed amendments to which the direction relates; and

(b) make the amendments to the relevant planning scheme.

(2) If a direction is given to the Commission under section 39I(3)(d) to make proposed amendments to the relevant planning scheme, the Commission may, under subsection (1) , make the proposed amendments altered so as to correct an anomaly or minor mistake that it is necessary to correct in order for the direction to be effectively implemented.

(3) Without limiting the generality of subsection (2) , the correction of a mistake or anomaly in accordance with that subsection includes the correction of a mistake or anomaly that has arisen by virtue of the relevant planning scheme having been amended in accordance with the direction.

(4) Within 14 days, or a longer period approved by the Minister, after the Commission receives under section 39I(3)(d) a direction to make proposed amendments to the relevant planning scheme, the Commission must notify the Minister of the making of the amendments under subsection (1) .

(5) The Minister must, as soon as practicable after receiving a notice under subsection (4) –

(a) give notice in the *Gazette*, and in a newspaper circulating generally in Tasmania, of the making of the amendments to the relevant planning scheme and the day on which the amendments are to come into effect; and

(b) notify the relevant planning scheme planning authority of –

(i) the making of the amendments; and

(ii) the day on which the amendments come into effect.

(6) Amendments to the relevant planning scheme made under subsection (1) come into effect on –

(a) a day, after the date on which the amendments were made, specified in the notice in the *Gazette* as the day on which they come into effect; or

(b) if no day is specified in the notice in the *Gazette* as the day on which they come into effect – 7 days after the day on which the notice appears in the *Gazette*.

(7) Amendments to the relevant planning scheme that have come into effect under subsection (6) are, despite any provision of the Land Use Planning and Approvals Act 1993 , to be takento have been made, to the relevant planning scheme, under that Act.

(8) Amendments to the relevant planning scheme made under subsection (1) are not a statutory rule for the purposes of the Subordinate Legislation Act 1992 .

39K. Contents of amendments to relevant planning scheme

(1) In this section –

draft LPS means a draft LPS to which the Land Use Planning and Approvals Act 1993 applies;

LPS has the same meaning as in the Land Use Planning and Approvals Act 1993 ;

site-specific qualification has the same meaning as in Schedule 6 to the Land Use Planning and Approvals Act 1993 .

(2) Proposed amendments to the relevant planning scheme, and amendments to the relevant planning scheme made under section 39J(1) , may only contain –

(a) provisions, regulating the planning of the use or redevelopment of the site and the use or redevelopment of the site, that are to apply under the Land Use Planning and Approvals Act 1993 and the relevant planning scheme; and

(b) any amendments to the relevant planning scheme required in order to give effect to the provisions referred to in paragraph (a) ; and

(c) amendments referred to in section 39J(2) .

(3) A provision that may, in accordance with subsection (2)(a) , be included in proposed amendments to the relevant planning scheme, or amendments to the relevant planning scheme made under section 39J(1) , may consist of a site-specific qualification.

(4) If, in accordance with subsection (3) , amendments to the relevant planning scheme made under section 39J(1) consist of a site-specific qualification –

(a) the site-specific qualification is –

(i) if it is, in accordance with this Division, part of the relevant planning scheme immediately before the day on which an LPS comes into force in relation to the site – to be taken to be a provision that, in accordance with clause 8 of Schedule 6 to the Land Use Planning and Approvals Act 1993 , must be contained in an LPS, but may be amended or revoked in accordance with this Division; or

(ii) if it becomes, in accordance with this Division, part of the relevant planning scheme after the day on which an LPS comes into force in relation to the site – to be taken to be a provision in relation to which a declaration has been given under clause 8A of that Schedule, but may be amended or revoked in accordance with this Division; and

(b) any other provisions, in relation to the site, of the relevant planning scheme, that consist of a site-specific qualification, are not to be taken to be provisions that, in accordance with clause 8 of that Schedule, must be contained in an LPS in relation to the site.

(5) If the Minister has prepared proposed amendments to the relevant planning scheme under section 39H(1) –

(a) before a direction has been issued under section 35B(4) of the Land Use Planning and Approvals Act 1993 in relation to a draft LPS that relates to the site – a direction may not be issued under that section of that Act in relation to a draft LPS that relates to the site; or

(b) after a direction has been issued under section 35B(4) of the Land Use Planning and Approvals Act 1993 in relation to a draft LPS that relates to the site but before an LPS comes into force in relation to the site and amendments – the draft LPS is to be taken for the purposes of that Act not to relate to the site.

(6) Amendments to the relevant planning scheme made under section 39J(1) –

(a) must further the requirements of the objectives set out in Schedule 1 to the Land Use Planning and Approvals Act 1993 ; and

(b) must be consistent with any applicable State Policy within the meaning of the State Policies and Projects Act 1993 ; and

(c) must be, as far as practicable, consistent with the Southern Regional Land Use Strategy made under the Land Use Planning and Approvals Act 1993 ; and

(d) if the relevant planning scheme is the *Sullivans Cove Planning Scheme 1997* –

(i) must be consistent with the Sullivans Cove Strategic Framework under Part B of that planning scheme; and

(ii) must not amend any listings under Schedule 1 – Conservation of Cultural Heritage Values, of that planning scheme.

39L. Minor amendment of relevant planning amendments

(1) The Minister may prepare a minor amendment to the relevant planning scheme and, by instrument in writing, approve the making of the minor amendment to the relevant planning scheme.

(2) An amendment is only to be taken to be a minor amendment under subsection (1) if the amendment –

(a) is to correct –

(i) a clerical mistake, or an accidental omission, in amendments to the relevant planning scheme made under section 39J(1) ; or

(ii) an evident material miscalculation of figures or an evident material mistake in the description of any person, thing or property referred to in amendments to the relevant planning scheme made under section 39J(1) ; and

(b) will not cause an increase in detriment to any person; and

(c) does not change the use or development that may, or may not, be carried out under the amendments to the relevant planning scheme made under section 39J(1) .

(3) The Minister may only approve under subsection (1) the making of a minor amendment –

(a) where the approval relates to a minor amendment of amendments to the relevant planning scheme, made under section 39J(1) , that apply to the area of land that is within the site on the day on which section 39G commences – if the approval is given within 12 months after those amendments came into effect; or

(b) where the approval relates to a minor amendment of amendments to the relevant planning scheme, made under section 39J(1) , that apply to an area of land that is within the site but was not within the site on the day on which section 39G commences – if the approval is given within 12 months after those amendments came into effect.

(4) A minor amendment referred to in subsection (1) may only consist of any one or more of the following:

(a) an amendment to the amendments to the relevant planning scheme made under section 39J(1) ;

(b) the revocation of one or more of the amendments to the relevant planning scheme made under section 39J(1) ;

(c) the amendment or revocation of the provisions of the planning scheme necessary to give effect to the amendment to, or revocation of, the amendments to the relevant planning scheme made under section 39J(1) .

(5) The Minister must consult with the Planning Minister in preparing a minor amendment under subsection (1) .

(6) Section 39I(3) and section 39J apply in relation to a minor amendment to which an approval under subsection (1) relates as if –

(a) a reference in either of those sections to the proposed amendments to the relevant planning scheme were a reference to the minor amendment; and

(b) a reference in either of those sections to amendments to the relevant planning scheme were a reference to the minor amendment.

(7) An approval of a minor amendment under subsection (1) , or a minor amendment made in accordance with this section, is not a statutory rule for the purposes of the Subordinate Legislation Act 1992 .

39M. Significant amendments to relevant planning amendments

(1) The Minister may prepare an amendment to the relevant planning scheme and, by instrument in writing, approve the making of the amendment to the relevant planning scheme.

(2) An approval under subsection (1) of the making of an amendment may only be made –

(a) where the approval relates to an amendment of amendments to the relevant planning scheme, made under section 39J(1) , that apply to the area of land that is within the site on the day on which section 39G commences – if the approval is given within 12 months after those amendments came into effect; or

(b) where the approval relates to an amendment of amendments to the relevant planning scheme, made under section 39J(1) , that apply to an area of land that is within the site but was not within the site on the day on which section 39G commences – if the approval is given within 12 months after those amendments came into effect.

(3) An amendment referred to in subsection (1) may only consist of any one or more of the following:

(a) an amendment to the amendments to the relevant planning scheme made under section 39J(1) ;

(b) the revocation of one or more of the amendments to the relevant planning scheme made under section 39J(1) ;

(c) the amendment or revocation of the provisions of the relevant planning scheme necessary to give effect to the amendment to, or revocation of, the amendments.

(4) The Minister must consult with the Planning Minister in preparing an amendment under subsection (1) .

(5) If an approval is given under subsection (1) in relation to an amendment under subsection (1) –

(a) a reference in section 39G to a request is to be taken to be a reference to the approval under subsection (1) ; and

(b) a reference in section 39G , section 39H, section 39I or section 39J to proposed amendments to the relevant planning scheme or a draft is to be taken to be a reference to the amendment under subsection (1) ; and

(c) a reference in section 39J or section 39K(6) to amendments to the relevant planning scheme is to be taken to be a reference to the amendment under subsection (1) .

(6) An approval under subsection (1) is not a statutory rule for the purposes of the Subordinate Legislation Act 1992 .

39N. Amendment under Land Use Planning and Approvals Act 1993 of relevant planning amendments

(1) Nothing in this Division is to be taken to permit the amendment under this Act of a provision of a planning scheme that is one of the State Planning Provisions, within the meaning of the Land Use Planning and Approvals Act 1993 .

(2) An amendment under the Land Use Planning and Approvals Act 1993 to provisions amended or inserted by the amendments to the relevant planning scheme made after consultation with the Planning Minister, as amended, if at all, under this Division, may only be made with the approval of the Minister.

(3) Subsection (2) ceases to apply in respect of amendments in relation to an area of land at the end of the period of 2 years after proposed amendments to the relevant planning scheme in relation to the area of land are approved under section 39I(1) .

8.2 Local Government (Meeting Procedures) Regulations 2015 - Review of Meeting Times
File Ref: F18/152771; 13-1-2

Memorandum of the General Manager of 20 December 2018.

Delegation: Committee

City of HOBART

MEMORANDUM: CITY PLANNING COMMITTEE

Local Government (Meeting Procedures) Regulations 2015 - Review of Meeting Times

Regulation 6(2) of the *Local Government (Meeting Procedures) Regulations 2015* require that after each ordinary election, a council and council committee are to review the times of commencement of their meetings.

Regulation 6(1) states that a meeting is not to start before 5:00 pm unless otherwise determined by the council committee by simple majority.

Accordingly, the commencement time for ordinary meetings of the City Planning Committee is submitted for consideration.

RECOMMENDATION

That in accordance with Regulation 6(2) of the Local Government (Meeting Procedures) Regulations 2015, the Committee determine the commencement time for ordinary meetings of the City Planning Committee.

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

N.D Heath
GENERAL MANAGER

Date: 20 December 2018
File Reference: F18/152771; 13-1-2

8.3 City Planning Division - Revised Fees and Charges - 2018/2019 Financial Year - Development Compliance
File Ref: F19/2045; 17/41

Memorandum of the Manager Development Compliance of 9 January 2019.

Delegation: Council

City of HOBART

MEMORANDUM: CITY PLANNING COMMITTEE

City Planning Division - Revised Fees and Charges - 2018/2019 Financial Year - Development Compliance

The purpose of this memorandum is to seek approval for revised fees and charges for the 2018/2019 financial year in respect to the City Planning Division.

Summary

At its meeting of 21 May 2018, the Council approved fees and charges for the 2018/2019 financial year. A review of the fees and charges approved by the Council has identified that a minor revision is required to better reflect the cost of the service provided by the Council in the City Planning Division.

The proposed revised fee is as follows:

Fee Description	Current Fee	Proposed Fee	GST	Unit
Application for Building Certificates for Class 1 and 10 buildings	$500	$800 plus $200 per hour of assessment	N	Per application
Application for Building Certificates for Class 2-9 buildings	$550	$1200 plus $200 per hour of assessment	N	Per application

Background

Pursuant to section 205 of the *Local Government Act 1993*, the Council may impose fees and charges for various services. Fees and charges are reviewed each year as part of the Council's annual budget process. At its meeting of 21 May 2018, the Council approved the fee of $500 per certificate for a building certificate for class 1 and 10 buildings and $550 per certificate for a building certificate for class 2 – 9 buildings.

Under section 83 of the *Building Regulations 2018* an application may be made to the General Manager for a building certificate certifying that the relevant council does not intend to take any action under the Act in relation to a building while the certificate is in force.

In order to determine if a certificate should be issued, Council is required to audit every single application for the building and undertake at least one inspection. The audit and inspection is required to be done by a suitably qualified person to ensure the building complies with the Act, complies with all building and plumbing approvals and complies with the provisions of the National Construction Code.
Council's external building surveyors undertake the audit and inspection and provide advice regarding compliance of the building. A number of applications have recently been processed and the experience has been that the assessment is time consuming and the cost to the Council significant.

Because the Council has previously required the application fee to be upfront, it does not on-charge the exact cost to the applicant and as a result the Council has, to date, absorbed the additional cost. As the certificate is entirely for the benefit of the applicant it is not appropriate that the Council absorb this cost.

Significant officer time is involved in identifying the applications which apply to the building, retrieving the files, undertaking an initial assessment and briefing the Council's external building surveyors. It is therefore proposed an application fee be imposed to cover the service provided by the officers in addition to an hourly rate which is expected to represent a full cost recovery for the work undertaken by the Council's officers and external building surveyors.

Proposal

It is proposed the 2018/2019 Fees and Charges be amended as detailed in the recommendation.

Financial Implications

Amendment of the fees as proposed will assist the Council in meeting budget expectations.

Delegation

The matter is delegated to the Council.

RECOMMENDATION

That the Council approve the following amended fees for 2018/2019 pursuant to section 205 of the Local Government Act 1993:

1. ***Application for a building certificate – class 1 and 10 buildings - $800 plus $200 per hour of assessment per application***

2. ***Application for a building certificate – class 2 - 9 buildings - $1200 plus $200 per hour of assessment per application***

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Kirsten Turner
MANAGER DEVELOPMENT COMPLIANCE

Date: 9 January 2019
File Reference: F19/2045; 17/41

8.4 City Planning - Advertising Report
File Ref: F19/1589

Memorandum of the Director City Planning of 9 January 2019 and attachment.

Delegation: Committee

City of HOBART

MEMORANDUM: CITY PLANNING COMMITTEE

City Planning - Advertising Report

Attached is the advertising list for the period 3 December 2018 – 4 January 2019.

RECOMMENDATION

That the information contained in the memorandum titled 'City Planning – Advertising Report' of 9 January 2019 be received and noted.

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Neil Noye
DIRECTOR CITY PLANNING

Date: 9 January 2019
File Reference: F19/1589

Attachment A: City Planning - Advertising Report ⇩

Application	Street	Suburb	Development	Works Value	Expiry Date	Referral	Proposed Delegation	Advertising Period Start	Advertising Period End
PLN-18-814	7 SEYMOUR STREET	NEW TOWN	Partial Demolition, Alterations and Extension	$275,000	06/01/2019	ayersh	Director	03/12/2018	17/12/2018
PLN-18-642	59 ATHLEEN AVENUE	LENAH VALLEY	Dwelling	$300,000	07/11/2018	ayersh	Director	03/12/2018	17/12/2018
PLN-18-774	9 OBERON COURT	DYNNYRNE	Dwelling	$200,000	25/12/2018	ayersh	Director	05/12/2018	19/12/2018
PLN-18-337	772 SANDY BAY ROAD	SANDY BAY	Dwelling	$450,000	27/07/2018	ayersh	Director	06/12/2018	20/12/2018
PLN-18-760	59 GROSVENOR STREET	SANDY BAY	Partial Demolition, Alterations and 13 Multiple Dwellings (Two Existing, 11 New)	$2,800,000	05/12/2018	ayersh	Council	06/12/2018	20/12/2018
PLN-18-571	36 KING STREET	SANDY BAY	Subdivision (Boundary Adjustment)	$0	06/10/2018	ayersh	Director	13/12/2018	30/12/2018
PLN-18-504	8 NIREE HEIGHTS	SANDY BAY	Two Multiple Dwellings (one existing, one new)	$500,000	13/09/2018	ayersh	Council	17/12/2018	04/01/2019
PLN-18-891	200 COLLINS STREET	HOBART	Alterations	$50,000	17/01/2019	ayersh	Director	20/12/2018	07/01/2019
PLN-18-612	14 BRACKEN LANE	FERN TREE	Alterations and Extension	$150,000	29/10/2018	baconr	Director	06/12/2018	20/12/2018
PLN-18-831	7 MACQUARIE STREET	HOBART	Alterations	$10,000	27/12/2018	baconr	Director	17/12/2018	04/01/2019
PLN-17-125	196 DAVEY STREET	SOUTH HOBART	Signage	$0	17/04/2017	langd	Delegated	04/12/2018	18/12/2018
PLN-18-895	3 / 245 CHURCHILL AVENUE	SANDY BAY	Partial Change of Use to Visitor Accommodation	$0	21/01/2019	langd	Director	17/12/2018	04/01/2019
PLN-18-835	21 STOKE STREET	NEW TOWN	Outbuilding (Shed)	$25,000	11/01/2019	maxwellv	Delegated	03/12/2018	17/12/2018
PLN-18-837	18 NORFOLK CRESCENT	SANDY BAY	Partial Demolition, Alterations, Extension and Front Fencing	$450,000	11/01/2019	maxwellv	Delegated	05/12/2018	19/12/2018
PLN-18-816	1 WESTINWOOD ROAD	LENAH VALLEY	Dwelling	$257,000	25/12/2018	maxwellv	Delegated	10/12/2018	27/12/2018
PLN-18-493	3 ERINDALE PLACE	SOUTH HOBART	Dwelling and Associated Vegetation Clearing	$500,000	11/09/2018	maxwellv	City Planning	14/12/2018	31/12/2018

Application	Street	Suburb	Development	Works Value	Expiry Date	Referral	Proposed Delegation	Advertising Period Start	Advertising Period End
PLN-18-859	24 GREGORY STREET	SANDY BAY	Change of Use to Boarding House	$0	07/01/2019	maxwellv	Delegated	14/12/2018	31/12/2018
PLN-18-874	36 WILLIAM STREET	WEST HOBART	Partial Demolition and New Garage	$30,000	10/01/2019	maxwellv	Delegated	17/12/2018	04/01/2019
PLN-18-822	133 ELIZABETH STREET	HOBART	Partial Demolition, Alterations, Signage and Partial Change of Use to General Retail and Hire	$25,000	10/01/2019	mcclenahanm	Director	03/12/2018	17/12/2018
PLN-18-623	4 DERWENT LANE	BATTERY POINT	Alterations, Outbuilding (Garage, Studio and Store) and Landscaping	$120,000	06/11/2018	mcclenahanm	Director	04/12/2018	18/12/2018
PLN-18-802	NEW TOWN ROAD	NEW TOWN	Bus Shelter	$25,000	19/12/2018	mcclenahanm	Council	11/12/2018	28/12/2018
PLN-18-811	8 ANGLESEA STREET	SOUTH HOBART	Partial Demolition, Alterations, Front Fence, Carport and Outbuilding (Shed)	$100,000	20/12/2018	mcclenahanm	Director	11/12/2018	28/12/2018
PLN-18-873	84 NEWDEGATE STREET	WEST HOBART	Partial Demolition, Alterations and Extension	$150,000	10/01/2019	mcclenahanm	Director	14/12/2018	31/12/2018
PLN-18-666	41 LOUDEN STREET	SOUTH HOBART	Dwelling	$225,000	05/11/2018	mcclenahanm	Director	17/12/2018	04/01/2019
PLN-18-775	27 / 212 COLLINS STREET	HOBART	Partial Change of Use to Visitor Accommodation and Signage	$100,000	11/12/2018	mcclenahanm	Council	20/12/2018	07/01/2019
PLN-18-508	13-15 RIDGEWAY ROAD (CT167006/2)	RIDGEWAY	Dwelling	$550,000	21/09/2018	obrienm	Director	11/12/2018	28/12/2018
PLN-18-295	9 & 11 STONEY STEPS ROAD	SOUTH HOBART	Dwelling, Driveway Upgrade and Associated Vegetation Clearance	$200,000	29/06/2018	sherriffc	Council	03/12/2018	17/12/2018

Application	Street	Suburb	Development	Works Value	Expiry Date	Referral	Proposed Delegation	Advertising Period Start	Advertising Period End
PLN-18-726	2 CHURCHILL AVENUE	SANDY BAY	Demolition, New Building for General Retail and Hire, Food Services and Business and Professional Services, Signage and Alterations to Parking	$400,000	07/12/2018	sherriffc	Director	04/12/2018	18/12/2018
PLN-18-842	33 POTTERY ROAD	LENAH VALLEY	Partial Demolition, Alterations and Extension	$150,000	31/12/2018	sherriffc	Director	11/12/2018	28/12/2018
PLN-18-773	4 A GREGSON AVENUE	NEW TOWN	Dwelling	$250,000	11/12/2018	sherriffc	Director	14/12/2018	31/12/2018
PLN-18-865	431 ELIZABETH STREET	NORTH HOBART	Partial Change of Use to Food Services (Mobile Food Van)	$0	08/01/2019	sherriffc	Director	19/12/2018	06/01/2019
PLN-17-431	7 LOUDEN STREET	SOUTH HOBART	Dwelling and Associated Hydraulic Infrastructure	$550,000	10/08/2017	smeea	Director	03/12/2018	17/12/2018
PLN-18-832	4 DAVID AVENUE	SANDY BAY	Partial Demolition, Alterations and Outbuilding (Shed)	$10,000	11/01/2019	smeea	Director	04/12/2018	18/12/2018
PLN-18-679	50 LOCHNER STREET	WEST HOBART	Partial Demolition, Driveway and New Building for Visitor Accommodation	$296,240	22/11/2018	smeea	Director	06/12/2018	20/12/2018
PLN-17-1066	66 BURNETT STREET	NORTH HOBART	Demolition and New Building for 57 Multiple Dwellings, 13 Visitor Accommodation Units, Food Services, and Signage	$28,000,000	02/02/2018	smeea	Council	20/12/2018	07/01/2019
PLN-18-619	45 LOCHNER STREET	WEST HOBART	Partial Demolition, Alterations and Extension	$50,000	23/10/2018	smeea	Director	20/12/2018	07/01/2019
PLN-18-639	20 THELMA DRIVE	WEST HOBART	Dwelling	$1,000,000	30/10/2018	smeea	Director	20/12/2018	07/01/2019
PLN-18-849	8 MURCHISON STREET	LENAH VALLEY	Partial Demolition and Outbuilding (Shed)	$20,000	06/01/2019	widdowsont	Director	04/12/2018	18/12/2018
PLN-18-860	77 - 79 ARGYLE STREET	HOBART	Partial Demolition, Alterations and Extension	$550,000	07/01/2019	widdowsont	Director	11/12/2018	28/12/2018

Application	Street	Suburb	Development	Works Value	Expiry Date	Referral	Proposed Delegation	Advertising Period Start	Advertising Period End
PLN-18-875	29 DOWDING CRESCENT	NEW TOWN	Dwelling	$400,000	10/01/2019	widdowsont	Director	17/12/2018	18/12/2018
PLN-18-530	125 BATHURST STREET	HOBART	Partial Demolition, Alterations and Redevelopment for General Retail and Hire, Food Services and 33 Multiple Dwellings	$9,000,000	25/09/2018	widdowsont	Council	18/12/2018	05/01/2019
PLN-18-881	395 - 401 ELIZABETH STREET	NORTH HOBART	Alterations	$6,000	15/01/2019	widdowsont	Director	20/12/2018	07/01/2019
PLN-18-890	42 ELIZABETH STREET	HOBART	Signage and Alterations	$0	17/01/2019	widdowsont	Director	20/12/2018	07/01/2019
PLN-18-738	1 - 5 RYDE STREET	NORTH HOBART	Partial Demolition and Alterations for Kiosk, and New Building for Coaches and Media Boxes	$830,000	29/11/2018	wilsone	Council	12/12/2018	29/12/2018
PLN-18-501	20 DOWDING CRESCENT (CT175128/83)	NEW TOWN	Dwelling	$348,500	13/09/2018	wilsone	Director	14/12/2018	15/12/2018
PLN-18-834	29 LOCHNER STREET	WEST HOBART	Partial Demolition, Alterations and Extension	$250,000	28/12/2018	wilsone	Council	15/12/2018	02/01/2019
PLN-18-883	726 A SANDY BAY ROAD	SANDY BAY	Partial Demolition, Alterations and Extension	$200,000	16/01/2019	wilsone	Director	15/12/2018	02/01/2019
PLN-18-784	5 MARGARET STREET	SANDY BAY	Alterations to Carparking and Access and Front Fencing (Gate)	$15,000	13/12/2018	wilsone	Director	18/12/2018	19/12/2018
PLN-18-580	ST JOHNS AVENUE	NEW TOWN	Partial Demolition, Alterations, Extension and Change of Use to Community Meeting and Entertainment	$400,000	08/10/2018	wilsone	Director	20/12/2018	07/01/2019
PLN-18-901	342 ARGYLE STREET	NORTH HOBART	Alterations, Partial Change of Use to Food Services and Signage	$60,000	23/01/2019	wilsone	Director	20/12/2018	07/01/2019

8.5 Delegated Decisions Report (Planning) File Ref: F19/1818

Memorandum of the Director City Planning of 9 January 2019 and attachment.

Delegation: Committee

City of HOBART

MEMORANDUM: CITY PLANNING COMMITTEE

Delegated Decisions Report (Planning)

Attached is the delegated planning decisions report for the period 5 December 2018 until 7 January 2019.

RECOMMENDATION

That the information contained in the memorandum titled 'Delegated Decisions Report (Planning)' of 9 January 2019 be received and noted.

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Neil Noye
DIRECTOR CITY PLANNING

Date: 9 January 2019
File Reference: F19/1818

Attachment A: Delegated Decisions Report (Planning) ⇩

7 January 2019

Delegated Decisions Report (Planning)

73 applications found.

Approved | Withdrawn / Cancelled | All

Planning Description	Address	Works Value	Decision	Authority
PLN-16-1239 Partial Demolition, Alterations and Extension	6 BROADWATERS PARADE SANDY BAY TAS 7005	$ 1,000	Approved	Delegated
PLN-17-125 Signage	196 DAVEY STREET SOUTH HOBART TAS 7004	$ 0	Approved	Delegated
PLN-17-163 Subdivision (1 Additional Lot)	792 SANDY BAY ROAD SANDY BAY TAS 7005	$ 70,000	Withdrawn	Applicant
PLN-17-431 Dwelling and Associated Hydraulic Infrastructure	7 LOUDEN STREET SOUTH HOBART TAS 7004	$ 550,000	Approved	Delegated
PLN-17-812 Partial Demolition, Alterations and Intensification of Community Meeting and Entertainment Use (Additional Cinema)	31 STRAHAN STREET NORTH HOBART TAS 7000	$ 180,000	Approved	Delegated
PLN-17-880 Subdivision (One Additional Lot)	27 PIRIE STREET NEW TOWN TAS 7008	$ 10,000	Withdrawn	Applicant
PLN-18-163 Garage	15 BEECHWORTH ROAD SANDY BAY TAS 7005	$ 200,000	Approved	Delegated
PLN-18-208 Partial Demolition, Alterations, Extension and Garage	28 WENTWORTH STREET SOUTH HOBART TAS 7004	$ 250	Approved	Delegated
PLN-18-296 Alterations	9 SHOOBRIDGE STREET GLEBE TAS 7000	$ 40,000	Approved	Delegated
PLN-18-337 Dwelling	772 SANDY BAY ROAD SANDY BAY TAS 7005	$ 450,000	Approved	Delegated
PLN-18-370 Partial Demolition, Alterations and Extension	33 DUKE STREET SANDY BAY TAS 7005	$ 400,000	Approved	Delegated
PLN-18-499 Ancillary Dwelling	5A LORD STREET SANDY BAY TAS 7005	$ 150,000	Approved	Delegated
PLN-18-508 Dwelling	13-15 RIDGEWAY ROAD (CT167006/2) RIDGEWAY TAS 7054	$ 550,000	Approved	Delegated
PLN-18-532 Alterations for Ancillary Dwelling	5 NEVADA STREET SOUTH HOBART TAS 7004	$ 0	Approved	Delegated
PLN-18-552 Partial Demolition, Alterations, Extension, Front Fencing and Two Multiple Dwellings (One Existing, One New)	2 NEWPORT STREET NORTH HOBART TAS 7000	$ 310,000	Approved	Delegated
PLN-18-571 Subdivision (Boundary Adjustment)	34 KING STREET SANDY BAY TAS 7005	$ 0	Approved	Delegated
PLN-18-578 Partial Change of Use to Visitor Accommodation	2/2 WAYNE AVENUE SANDY BAY TAS 7005	$ 0	Approved	Delegated
PLN-18-612 Alterations and Extension	14 BRACKEN LANE FERN TREE TAS 7054	$ 150,000	Approved	Delegated
PLN-18-613 Subdivision (One Additional Lot)	37 MOUNT STUART ROAD MOUNT STUART TAS 7000	$ 0	Approved	Delegated
PLN-18-623 Alterations, Outbuilding (Garage, Studio and Store) and Landscaping	4 DERWENT LANE BATTERY POINT TAS 7004	$ 120,000	Approved	Delegated
PLN-18-638 Alterations, Extension and Outbuilding (Garage and Studio)	7 SAUNDERS CRESCENT SOUTH HOBART TAS 7004	$ 80,000	Approved	Delegated
PLN-18-640 Partial Demolition, Alterations and Extensions	130 BRISBANE STREET HOBART TAS 7000	$ 200,000	Approved	Delegated
PLN-18-642 Dwelling	59 ATHLEEN AVENUE LENAH VALLEY TAS 7008	$ 300,000	Approved	Delegated
PLN-18-662 Partial Demolition, Alterations, Extension and Front Fencing	7 SENATOR STREET MOUNT STUART TAS 7000	$ 200,000	Approved	Delegated

Planning Description	Address	Works Value	Decision	Authority
PLN-18-674 Alterations and Partial Change of Use to Food Services	479 SANDY BAY ROAD SANDY BAY TAS 7005	$ 1,000	Approved	Delegated
PLN-18-679 Partial Demolition, Driveway and New Building for Visitor Accommodation	50 LOCHNER STREET WEST HOBART TAS 7000	$ 296,240	Approved	Delegated
PLN-18-686 Partial Demolition, Alterations and Front Fencing	2 SUNCREST AVENUE LENAH VALLEY TAS 7008	$ 50,000	Approved	Delegated
PLN-18-691 Partial Demolition, Alterations and Extension	216-218 ELIZABETH STREET HOBART TAS 7000	$ 155,000	Approved	Delegated
PLN-18-693 Alterations	4 RUSSELL CRESCENT SANDY BAY TAS 7005	$ 30,000	Approved	Delegated
PLN-18-708 Partial Demolition, Alterations, Extension, Signage, and Partial Change of Use to Business and Professional Services and Sports and Recreation	85-99 COLLINS STREET HOBART TAS 7000	$ 4,000,000	Approved	Delegated
PLN-18-709 Dwelling	3 WESTINWOOD ROAD LENAH VALLEY TAS 7008	$ 180,000	Approved	Delegated
PLN-18-726 Demolition, New Building for General Retail and Hire, Food Services and Business and Professional Services, Signage and Alterations to Parking	2 CHURCHILL AVENUE SANDY BAY TAS 7005	$ 400,000	Approved	Delegated
PLN-18-727 Partial Demolition and Alterations	85 CREEK ROAD NEW TOWN TAS 7008	$ 250,000	Approved	Delegated
PLN-18-739 Subdivision (Boundary Adjustment), Partial Demolition, Alterations and Extension including Access Ramp	112 MURRAY STREET HOBART TAS 7000	$ 500,000	Approved	Delegated
PLN-18-743 Partial Demolition, Alterations and Extension	107 NEW TOWN ROAD NEW TOWN TAS 7008	$ 600,000	Approved	Delegated
PLN-18-746 Partial Demolition, Alterations and Extension	1 WENTWORTH STREET SOUTH HOBART TAS 7004	$ 150,000	Approved	Delegated
PLN-18-750 Dwelling	27 DOWDING CRESCENT NEW TOWN TAS 7008	$ 360,000	Approved	Delegated
PLN-18-756 Alterations (Deck)	22 ASCOT AVENUE SANDY BAY TAS 7005	$ 20,000	Approved	Delegated
PLN-18-757 Partial Change of Use to Eating Establishment	2/19-21 CASTRAY ESPLANADE BATTERY POINT TAS 7004	$ 19,300	Approved	Delegated
PLN-18-761 Partial Demolition, Alterations and Extension	2 POETS ROAD WEST HOBART TAS 7000	$ 200,000	Approved	Delegated
PLN-18-763 Dwelling	270A LENAH VALLEY ROAD (CT 175675/15) LENAH VALLEY TAS 7008	$ 400,000	Approved	Delegated
PLN-18-767 Partial Demolition and Alterations	4 MARINE TERRACE BATTERY POINT TAS 7004	$ 98,000	Approved	Delegated
PLN-18-771 Signage	4 RUSSELL CRESCENT SANDY BAY TAS 7005	$ 0	Approved	Delegated
PLN-18-774 Dwelling	9 OBERON COURT DYNNYRNE TAS 7005	$ 200,000	Approved	Delegated
PLN-18-778 Partial Demolition, Alterations and Extension	21 RATHO STREET LENAH VALLEY TAS 7008	$ 200,000	Approved	Delegated
PLN-18-780 Partial Demolition and Alterations	160 MELVILLE STREET HOBART TAS 7000	$ 14,000	Approved	Delegated
PLN-18-782 Dwelling	7 DOWDING CRESCENT NEW TOWN TAS 7008	$ 320,000	Approved	Delegated
PLN-18-790 Partial Change of Use to Visitor Accommodation	1/10 QUAYLE STREET SANDY BAY TAS 7005	$ 0	Approved	Delegated
PLN-18-793 Partial Demolition and Alterations	22 RISDON ROAD NEW TOWN TAS 7008	$ 10,000	Approved	Delegated

Planning Description	Address	Works Value	Decision	Authority
PLN-18-794 Partial Demolition, Alterations and Extension	30 PROCTORS ROAD DYNNYRNE TAS 7005	$ 100,000	Approved	Delegated
PLN-18-799 Signage	FRANKLIN WHARF HOBART TAS 7000	$ 20,000	Approved	Delegated
PLN-18-809 Partial Demolition, Alterations and Extension	37 HAMPDEN ROAD BATTERY POINT TAS 7004	$ 1,000,000	Approved	Delegated
PLN-18-81 Multiple Dwellings	3 DENNING CLOSE NEW TOWN TAS 7008	$ 380,000	Withdrawn	Applicant
PLN-18-810 Partial Demolition and Alterations	35 ELIZABETH STREET HOBART TAS 7000	$ 10,000	Approved	Delegated
PLN-18-814 Partial Demolition, Alterations and Extension	7 SEYMOUR STREET NEW TOWN TAS 7008	$ 275,000	Approved	Delegated
PLN-18-816 Dwelling	1 WESTINWOOD ROAD LENAH VALLEY TAS 7008	$ 257,000	Approved	Delegated
PLN-18-820 Alterations and Extension to Outbuilding (Studio)	45 D'ARCY STREET SOUTH HOBART TAS 7004	$ 100,000	Approved	Delegated
PLN-18-821 Partial Demolition, Alterations, Extension and Carport	15 SECHERON ROAD BATTERY POINT TAS 7004	$ 35,000	Approved	Delegated
PLN-18-822 Partial Demolition, Alterations, Signage and Partial Change of Use to General Retail and Hire	133 ELIZABETH STREET HOBART TAS 7000	$ 25,000	Approved	Delegated
PLN-18-823 Partial Demolition and Alterations	20 SYME STREET SOUTH HOBART TAS 7004	$ 50,000	Approved	Delegated
PLN-18-825 Dwelling	11 WILLIAM COOPER DRIVE NEW TOWN TAS 7008	$ 345,372	Not Required	Delegated
PLN-18-828 Partial Demolition, Alterations and Extension	247 BATHURST STREET WEST HOBART TAS 7000	$ 100,000	Approved	Delegated
PLN-18-829 Alterations for Garage	7 CRELIN STREET BATTERY POINT TAS 7004	$ 50,000	Approved	Delegated
PLN-18-832 Partial Demolition, Alterations and Outbuilding (Shed)	4 DAVID AVENUE SANDY BAY TAS 7005	$ 10,000	Approved	Delegated
PLN-18-835 Outbuilding (Shed)	21 STOKE STREET NEW TOWN TAS 7008	$ 25,000	Approved	Delegated
PLN-18-837 Partial Demolition, Alterations, Extension and Front Fencing	18 NORFOLK CRESCENT SANDY BAY TAS 7005	$ 450,000	Approved	Delegated
PLN-18-843 Outbuilding	199 WATERWORKS ROAD DYNNYRNE TAS 7005	$ 28,000	Approved	Delegated
PLN-18-849 Partial Demolition and Outbuilding (Shed)	8 MURCHISON STREET LENAH VALLEY TAS 7008	$ 20,000	Approved	Delegated
PLN-18-851 Partial Demolition, Alterations (including Re-roofing) and Fencing	3 MARINE TERRACE BATTERY POINT TAS 7004	$ 10,000	Approved	Delegated
PLN-18-913 Partial Demolition, Alterations and Extension	38 RAYMONT TERRACE MOUNT STUART TAS 7000	$ 50,000	Not Required	Delegated
PLN-18-924 Alterations and Partial Change of Use to Multiple Accommodation	31 CAMPBELL STREET HOBART TAS 7000	$ 600,000	Approved	Delegated
PLN-18-927 Alterations	12 BALFOUR COURT SANDY BAY TAS 7005	$ 20,000	Approved	Delegated
PLN-18-930 Change of Use to Multiple Accommodation (Student Accommodation)	40 BROOKER AVENUE HOBART TAS 7000	$ 0	Approved	Delegated

9. RESPONSES TO QUESTIONS WITHOUT NOTICE

Regulation 29(3) *Local Government (Meeting Procedures) Regulations 2015.*
File Ref: 13-1-10

The General Manager reports:-

"In accordance with the procedures approved in respect to Questions Without Notice, the following responses to questions taken on notice are provided to the Committee for information.

The Committee is reminded that in accordance with Regulation 29(3) of the *Local Government (Meeting Procedures) Regulations 2015*, the Chairman is not to allow discussion or debate on either the question or the response."

9.1 Application for Extended Hours of Licensed Premises File Ref: F18/153112; 13-1-10

Memorandum of the Acting Associate Director Community and Culture of 9 January 2019 and attachment.

Delegation: Committee

That the information be received and noted.

City of HOBART

Memorandum: **Lord Mayor**
Deputy Lord Mayor
Aldermen / Councillors

Response to Question Without Notice

APPLICATION FOR EXTENDED HOURS OF LICENSED PREMISES

Meeting: City Planning Committee **Meeting date: 10 December 2018**

Raised by: Deputy Lord Mayor Councillor Burnet

Question:

Due to the recent increase of applications seeking extended trading hours for licensed premises in the vicinity of the CBD, could the Director please advise what if any consultation is being undertaken with licensees, community assistance groups and the Council?

Response:

Current Consultation

The City of Hobart has recently commenced convening Late Night Precinct Stakeholder (LNPS) meetings with representatives from the Liquor and Gaming Branch of Treasury and Finance, the Tasmanian Hospitality Association and Tasmania Police, all of whom work directly with licensees.

The first meeting of this new entity was on 1 November 2018 with the meeting's agenda focused on future funding for the Street Teams Project beyond 31 December 2018, as well as complaints about the behaviour of some taxi drivers touting for business within Salamanca Place and Despard Street areas, rather than using the Taxi Rank in Castray Esplanade.

In early December 2018, the City of Hobart was asked to send a representative to a meeting organised by the Department of Treasury and Finance regarding complaints by accommodation services in and around Despard Street. There were a range of issues in the complaint associated with licensed venues in the area.

A resolution from that meeting was to call a meeting of the LNPS, which was held on 12 December. The members of the LNPS agreed to undertake a number of actions in response to the issues raised. Minutes from this meeting can be found at **Attachment A**.

It was noted at this meeting that Tasmania Police and the THA were unaware of the proposed extension of operating hours requested in the DAs recently approved by the Council and that they would have expressed concerns if aware. It is proposed that mechanisms be put in place to ensure members of the LNPS are made aware of all DAs that involve changes to licensed premises operations so that they can make a representation if appropriate.

This process would match a similar process undertaken by the Liquor Licensing Commission, who seek advice, particularly from Tasmania Police, about new or changes to existing liquor licences.

Council officers have also developed a draft Community Safety Commitment that will be presented to the Council for consideration within the next few months. It is anticipated that this document will also clarify and strengthen the mechanisms for engaging with licensees and organisations involved in the night time economy.

Background Information

Regular meetings with allied community safety partners have been convened by the City of Hobart biannually since late 2016. Representatives attend from the Liquor and Gaming Branch of Treasury and Finance, the Tasmanian Hospitality Association, Tasmania Police, the Salvation Army's Street Teams Management, SL Security (who provide security services at the Salamanca Taxi Rank and the Salamanca Square public toilet facility) and the Tasmanian Taxi Council (South). Staff from other divisions of the City of Hobart have attended as required.

Prior to that, between 2009 and 2015 the Safer Hobart Partnership (SHP) was coordinated and chaired by the City of Hobart. This partnership was a quarterly meeting of government agencies and private businesses and responded to issues much broader than just liquor licensing and the night time economy, including skateboarding and other behavioural challenges by young people in the CBD; anti-graffiti strategies; issues impacting on migrants, humanitarian entrants and international students as well as closed circuit television.

Amongst the SHP's successes were the introduction of the Street Team Project with the Salvation Army and the employment of security guards at the Salamanca Taxi Rank on Friday and Saturday nights. Both of these initiatives are credited by Tasmania Police as reducing public place assaults in the area by 53 per cent. However, by the end of 2015 interest from the numerous parties involved in the SHP wanned, with a drop off in attendances at the quarterly meetings resulting in a cessation of the SHP in 2016.

There are 392 premises that have licences to serve alcohol within the Hobart Local Government Area according to data provided by the Liquor and Gaming Branch at the Department of Treasury and Finance on 30 November 2018.

The table below is a breakdown of licensed premises by suburbs across the Hobart Local Government Area.

Suburb	Number of licensed venues
Battery Point	51
Cornelian Bay	1
Fern Tree	1
Glebe	2
Hobart	177
Lenah Valley	5
Mount Stuart	1
New Town	22
North Hobart	50
Queens Domain	1
Sandy Bay	48
South Hobart	14
West Hobart	13

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Kimbra Parker
ACTING ASSOCIATE DIRECTOR
COMMUNITY AND CULTURE

Date: 9 January 2019
File Reference: F18/153112; 13-1-10

Attachment A: Late Night Precinct Stakeholder Meeting Minutes – 12 December 2018 ⇩

STG-F-1101/2
12/11/2010
Meeting No.

LATE NIGHT PRECINCT STAKEHOLDERS MEETING

NOTES OF MEETING

Meeting held on 12 December 2018 from 1230 - Lady Osborne Room- Hobart Town Hall.

PRESENT

NAME	Ref	POSITION
Neil Noye	NN	City of Hobart – Director, City Planning
Luke Doyle (Chair)	LD	City of Hobart – Future, Engaged and Active Communities
Angela Moore	AM	City of Hobart – Traffic Engineering
Kirsten Turner	KT	City of Hobart – Compliance and Permits
Damien Suter	DS	City of Hobart – Cleansing and Solid Waste
Sophie Calic	SC	City of Hobart – Inclusive, Resilient and Creative Communities
Paul Medhurst	PM	City of Hobart – Cleansing and Solid Waste
Scott Davis (Minutes)	SD	Community Development Officer (Community Safety) City of Hobart
Helen Gangell	HG	Compliance – Liquor and Gaming Branch Department of Treasury and Finance
Paul Smith	PS	Compliance - Liquor and Gaming Branch Department of Treasury and Finance
Joanne Stolp	JS	Inspector – Hobart Division – Tasmania Police
John Ward	JWd	Inspector - Support District –Tasmania Police
Darren Latham	DL	Senior Sergeant – Hobart Division – Tasmania Police
Brett Pullen	BP	Constable - Tasmania Police – Licensing
Greg Astell	GA	Tasmanian Hospitality Association
Savali Lopa	SL	SL Security
Fiona Lopa	FL	SL Security
Guy Stainsby	GS	Street Teams – Salvation Army
Jess Wilson	JWn	Marketing and Client Services – 13 CABS – Taxi Council

APOLOGIES

Name	Ref	Position
Kimbra Parker	KP	City of Hobart – Community and Culture Division
Penny Chugg	PC	Salvation Army

AGENDA ITEMS

1. **Around the table introductions**

2. **Recap of key issues raised at previous meeting**
   - Ongoing funding challenges for the Street Teams project
   - Taxis not using the taxi rank, trawling along Salamanca Place, Brooke Street and Despard Street to pick up passengers

3. **Actions items from previous meeting**
   - Letters of support to Salvation Army for ongoing funding: letters provided
   - Taxi newsletter to encourage use of the Taxi Rank: newsletter distributed
   - Fourth birthday celebration of Street Teams: event held on Salamanca Lawns 3 December

4. **Background to today's meeting**

   This irregular meeting comes as a result of concerns raised with the Treasurer of Tasmania by owners/operators of tourist accommodation in the Despard Street area. Concerns raised included:
   - noise from night clubs resulting in sleep disruption for guests in nearby accommodation;
   - specific mention of Mobius and Lower House;
   - taxis and Uber vehicles lining up in the area waiting for night club patrons;
   - cleanliness of the street; and
   - the damage to the tourism brand of the area.

   The Treasurer convened a meeting on Friday 7 December with Police, City of Hobart and Department of Liquor and Gaming. A decision was made to to convene a second meeting of key stake holders to work towards actions in response to the issues raised.

   Since the first meeting, additional concerns have been reported regarding similar issues in Wooby's Lane. These additional issues are considered relevant for action alongside concerns raised regarding Despard Street, and so are included for consideration. Concerns specifically include:
   - cleanliness in Wooby's Lane, smashed glasses and general rubbish;
   - people using the lane as a public toilet as to vomit;
   - damage to windows of other shops in the area;
   - concerns about the numbers of patrons allowed in the venues in the early hours; and
   - responsible Service of Alcohol compliance.

5. **Group discussions and action items**

   The various issues were discussed in detail and a number of solutions and potential solutions were identified.

   5.1. Lock out conditions placed on licensed premises: Concern was expressed about the recent planning approvals to extend trading hours for a number of venues. Some were concerned that this may encourage other venues to make similar applications. It was suggested that the use of lock-outs from venues after 3am may assist in reducing noise and antisocial behaviour, as it would cause the dispersion of people over a couple hours, rather than large groups leaving venues at the same time. It was noted that lock-out laws in Newcastle, NSW have been effective in reducing a range of anti-social issues associated with licensed premises. It was identified that there is currently one venue in Hobart that has lock-out conditions attached to its licence. The condition on that venue was the result of evidence produced by Tasmania Police and provided to the Liquor Licensing Commissioner. For lock-out conditions to be applied to other venues, similar evidence

would need to be produced to the Commissioner. It was noted that this is not the sole role of Tasmania Police, but that all parties around the table should take responsibility for the gathering and communication of evidence.

It was noted that the period between 4am and 5am is an important break in trading that enables time for people to disperse, the area to be appropriately cleansed

Action Items:

- Representatives at this meeting to gather evidence about any licensed premises that may indicate a need for lock-out conditions, and to forward to the Community Safety Officer at the City of Hobart via email to communitysafety@hobartcity.com.au.
- The City Of Hobart to take responsibility for co-ordinating and drafting any letters to the Licensing Commissioner.

5.2. Creation of a Smoke Free Zone in Despard Street: It was discussed that one solution to noise levels in Despard Street may be the introduction of a Smoke Free Zone that would require smokers to move away from accommodation businesses. This may also assist with any lock-out conditions attached to any premises in the Despard Street area, as patrons once exited to smoke would be denied re-entry, assisting in the dispersal of patrons over a number of hours rather than all at closing time.

Action item: City of Hobart to explore the possibility of making Despard Street area smoke free.

5.3. Taxi congestion in the Waterfront Precinct Despard Street: It was raised that the congestion of taxis waiting to attract passengers leaving licensed premises in Despard Street and Brooke Street, is having a significant impact on the ability for emergency services to access the area. It was noted that this also contributes to the noise. A similar issue was discussed at the 1 Nov 2018 meeting with resulting action by the Taxi Council, informing drivers, through their monthly newsletter, of the requirement to use the Taxi Rank in Castray Esplanade.

A query was made regarding the possibility of making the some parts of the waterfront precinct service vehicle free, through signage between certain hours. It was felt that this signage is often ignored and may have unintended consequences. It was agreed that other measures should be trialled first.

A suggested way to encourage taxi drivers to use the taxi rank may be the introduction of an initiative similar to the model used at airports, where taxis are ranked and called up to pick up passengers as needed. The City of Hobart have plans to extend the current taxi rank in Castray Esplanade and are considering other options. It was also noted that from 16 December the taxi rank will move from Castray Esplanade to Murray Street for the Taste of Tasmania.

Action item: The City of Hobart to lead a working group, post Taste of Tasmania, to explore initiatives to improve compliance in the use of the taxi rank and to reduce taxi congestion in the waterfront precinct.

5.4. Having security undertake foot patrols of the waterfront precinct: People spoke of the success of the Salvation Army's Street Teams initiative and the use of security at the taxi rank and Salamanca Square public toilets as a positive calming presence contributing to a reduction in public place assaults in the area. It was suggested that having security guards patrol the precinct may further enhance the calming and that this is a more efficient and economical model than directing additional police to the area. Security may also be used to gain compliance in any future smoke free zone, and also with taxis and other ride share

vehicles banking up away from the Taxi Rank.

Action item: Agreed that it was a worthy idea but currently no funding exists for this proposal. Consideration of possible funding provision by all stakeholders.

5.5. Cleaning of streets and public amenities: issues raised included: rubbish around licensed venues; people using public places to relieve themselves; recent change of cleaning times at the Salamanca Square public toilets. It was noted that the numbers of people leaving venues in the early hours often makes it challenging for City of Hobart cleaning staff to enter the area safely, making cleansing untenable at certain times and locations It was noted that some patrons may be unfamiliar with the public toilets in Salamanca Square.

Action items:

- City of Hobart to explore options to improve street cleansing.
- City of Hobart to review its cleansing times for Salamanca Square toilets.
- City of Hobart to improve signage in the Wooby's Lane area directing people to the public toilets in Salamanca Square.

5.6. Extending the hours of the Street Teams initiative to match licensed premises closure times. It was noted that, with the recent extension of operating times by some licensed premises, the Street Teams will have ceased operating before these premises close. There was concern that the mismatching of these times may have a negative impact on behaviour. The Salvation Army advised that their current funding will end in April 2019. Without ongoing funding they will not be operating the Street Teams and without additional funding they would not be in a position to extend operating times.

Action item: It was noted that the Salvation Army have applied to the State Government for ongoing funding. Consideration of possible funding provision by all stakeholders.

5.7. Capacity issues raised with the City of Hobart. It has been suggested to the City of Hobart that some venues were regularly exceeding their venue capacities, especially in the early hours of the morning. It is believed this may be contributing to people using public places to relieve themselves rather than using venue facilities, especially in the Wooby's Lane area. It was suggested that licensed premises may not undertake head counts. Security advised that they had difficulty in obtaining capacity sizes for venues from licensed premises.

Action item: City of Hobart to provide security with crowd capacity for venues to enable head counts to be undertaken.

MEETING CLOSED: 1325

DATE AND VENUE OF NEXT MEETING: TBA –LATE FEB 2019

10. QUESTIONS WITHOUT NOTICE

Section 29 of the *Local Government (Meeting Procedures) Regulations 2015*.
File Ref: 13-1-10

An Alderman or Councillor may ask a question without notice of the Chairman, another Alderman, Councillor, the General Manager or the General Manager's representative, in line with the following procedures:

1. The Chairman will refuse to accept a question without notice if it does not relate to the Terms of Reference of the Council committee at which it is asked.
2. In putting a question without notice, an Alderman or Councillor must not:
   (i) offer an argument or opinion; or
   (ii) draw any inferences or make any imputations – except so far as may be necessary to explain the question.
3. The Chairman must not permit any debate of a question without notice or its answer.
4. The Chairman, Aldermen, Councillors, General Manager or General Manager's representative who is asked a question may decline to answer the question, if in the opinion of the respondent it is considered inappropriate due to its being unclear, insulting or improper.
5. The Chairman may require a question to be put in writing.
6. Where a question without notice is asked and answered at a meeting, both the question and the response will be recorded in the minutes of that meeting.
7. Where a response is not able to be provided at the meeting, the question will be taken on notice and
   (i) the minutes of the meeting at which the question is asked will record the question and the fact that it has been taken on notice.
   (ii) a written response will be provided to all Aldermen and Councillors, at the appropriate time.
   (iii) upon the answer to the question being circulated to Aldermen and Councillors, both the question and the answer will be listed on the agenda for the next available ordinary meeting of the committee at which it was asked, where it will be listed for noting purposes only.

11. CLOSED PORTION OF THE MEETING

That the Committee resolve by majority that the meeting be closed to the public pursuant to regulation 15(1) of the *Local Government (Meeting Procedures) Regulations 2015* because the items included on the closed agenda contain the following matters:

- Legal action to be taken by, or involving the Council.

The following items were discussed: -

Item No. 1	Minutes of the last meeting of the Closed Portion of the Council Meeting
Item No. 2	Consideration of supplementary items to the agenda
Item No. 3	Indications of pecuniary and conflicts of interest
Item No. 4	City Acting as Planning Authority
Item No. 4.1	Applications under the City of Hobart Planning Scheme
Item No. 4.1.1	1 Shepherd Street & 3 Shepherd Street & 3A Shepherd Street & 1/3A Shepherd Street & 2/3A Shepherd Street, Sandy Bay - Multiple Dwellings - PLN-16-1022 - Appeal - Mediation LG(MP)R 15(4)(a)
Item No. 5	Questions Without Notice