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25 COLLEGE ROAD KENT TOWN SOUTH AUSTRALIA

11 April 2017

Project Description

The proposed development consists of the construction of a multi-storey residential development comprised of common ground floor incorporating 85 car parks, 54 bike parks and storage, three residential apartment buildings including Building 1 (19 dwellings over 5), Building 2 (26 dwellings over 7 storeys) and Building 3 (25 dwellings over 6 storeys), 8 two storey row dwellings and communal open space with pedestrian access ways.

Project Staging

The proposed development incorporated various stages of development including;

1) Demolition of existing structures,

2) Construction of residential Buildings 2 & 3 including common areas,

3) Construction of residential Building 1,

4) Construction of Townhouses.

Estimated Project Value

$24.1m

Project Team

- Client: 25 CKT Pty Ltd
- Applicant: Scope Development Solutions
- Architecture: Pruszinski Architects
- Planning: Heynen Planning Consultants
- Acoustics: Sonus
- Energy: TMK Consulting Engineers
- Stormwater: PT Design
- Traffic: Cirqa
- Refuse: Pruszinski Architects
- Landscape: Aspect Studios
- Environmental Assessment: Mott MacDonald

Reports

- Planning Statement – Heynen Planning Consultants
- Acoustic Report – Sonus
- Energy Report – TMK Consulting Engineers
- Traffic Report – Cirqa
- Stormwater Management Report – PT Design
- Waste Management Statement – Pruszinski Architects
- Landscape Concept Report – Aspect Studios
- Preliminary Environmental Site History – Mott MacDonald
- Soil and Groundwater Assessment – Mott MacDonald

Documents – Pruszinski Architects

- 16649-01 – Site and Location Plan
- 16649-02 – Ground Floor Plan
- 16649-03 – Level 1 Floor Plan
- 16649-04 – Level 2 Floor Plan
- 16649-05 – Level 3 – 4 Floor Plan
- 16649-06 – Level 5 Floor Plan
- 16649-07 – Level 6 Floor Plan
- 16649-08 – Inspirations
- 16649-09 – Elevations
- 16649-10 – Perspectives
- 16649-11 – Streetscapes
- 16649-12 – Streetscapes
- 16649-13 – Sections
- 16649-14 – Sunshading

Documents – PT Design – Civil

- 18811-C01 and C02 – Basement Level Drainage Layout
- 18811-C03 and C04 – Ground Level Drainage Layout

Appendices

1. Electricity Declaration Form
2. Certificate of Title
3. Summary of Domestic Storage
4. ODASA Pre-lodgement Application Form
5. ODASA Pre-lodgement Agreement
6. Materials and Finishes Board (Physical Copy)

HEYNEN PLANNING CONSULTANTS STATEMENT

Location:	25 College Road KENT TOWN SA 5067
Certificate of Title:	Vol. 6130 Fol. 16
Applicant:	Scope Development Solutions
Development Description:	Multi-storey Residential Development comprised of Common Ground Floor Incorporating 85 Car Parks, 54 Bike Parks and Storage, Three Residential Flat Buildings including 19 Dwellings, 26 Dwellings and 25 Dwellings over 5 storeys 7 storeys and 6 storeys respectively, 8 Two Storey Row Dwellings and Communal Open Space and Pedestrian Access ways

Zone:	Urban Corridor
Policy Area:	High Street 14.3
Planning Authority:	Development Assessment Commission
Relevant Council:	City of Norwood, Payneham & St Peters

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CONTENTS:

DOCUMENTS CONSIDERED: 3

SUPPLEMENTARY ASSESSMENT: 3

CATEGORISATION OF THE DEVELOPMENT: 4

THE SITE AND HISTORY: 5

THE PROPOSAL: 6

OVERVIEW: 7
BUILT FORM AND DESIGN (GENERAL OVERVIEW): 8

THE LOCALITY: 9

PLANNING ASSESSMENT: 10

THE DEVELOPMENT PLAN: 10
ASSESSMENT APPROACH: 11
Appropriateness of the Proposed Use 12
Appropriateness of the Proposed Dwelling Density 14
Appropriateness of the Proposed Building Height 15
Built Form and Set Backs 16
Design and Appearance 18
Open Space and Dwelling Functionality 19
Interaction with the Public Realm and Adjoining Land 25
Crime Prevention through Environmental Design 26
Traffic Access, Safety and Parking 27

SUMMARY: 27

Document Control

Revision	Description	Author	Date
V1	Planning Statement for lodgement	GH	13/3/2017
V2	Supplementary Assessment provided	GH	30/4/2017

DOCUMENTS CONSIDERED:

Heynen Planning Consultants has been requested by Scope Development Solutions to consider the following documents (dated variously and by different authors) and provide a planning opinion on the merit of the proposed multi-storey residential development[1] at 25 College Road, Kent Town:

- Development application form;
- Electricity Declaration form;
- Certificate of Title;
- Site and location plan (Pruszinski Architects);
- Floor plans (Pruszinski Architects);
- Elevations (Pruszinski Architects);
- Sheet detailing design inspirations and context (Pruszinski Architects);
- Perspectives (Pruszinski Architects);
- Streetscapes (Pruszinski Architects);
- Sections (Pruszinski Architects);
- Sunshading drawings (Pruszinski Architects);
- Summary of domestic storage (Pruszinski Architects);
- Typical kitchen cabinetry (Pruszinski Architects);
- Acoustic report (Sonus);
- Heating and cooling load assessment (TMK);
- Stormwater management report and 4 associated sheets (PT Design);
- Environmental soil and groundwater assessment (Mott Macdonald)
- Traffic and parking assessment (Cirqa);
- Waste management statement (Pruszinski Architects); and
- Landscaping concept report (Aspect Studios).

Additionally, I have reviewed the City of Norwood, Payneham & St Peters Development Plan (consolidated 28 April 2016), inspected the site and locality, considered various relevant Australian Standards and professional codes and reviewed the Development Act and Regulations to inform my opinion in relation to this matter.

SUPPLEMENTARY ASSESSMENT:

The applicant received feedback from DPTI on 29 March 2017 which included assessment comments pertaining to storage provision, materials, waste collection methodology, organic waste, project staging, acoustic requirements, heating and cooling load, bike parking, landscaping and planting details, landscaping structures and environmental site history.

I have been provided with a bundle of documents collated by Pruszinski Architects (including amended architectural drawings and technical reports) which provide clarification and consistency with respect the points raised by DPTI. In the main the additional documents offer greater detail and refinement of the proposed development.

More specifically, having reviewed the additional information from Cirqa and Aspect Studios I confirm that my opinion with respect to "traffic, safety and parking", landscaping and interaction with the public realm remain supportive of the proposed development.

[1] For brevity the Development Description from Page 1 of this report will be generally described throughout as the "multi-storey residential development".

In relation to the storage provision for each dwelling, as assessed under the heading of "open space and dwelling functionality", I note that the ground floor has been revised to include a storage cage for each dwelling within the residential flat buildings (noting that the row dwellings previously achieved the 8 m^3 guideline in the Development Plan).

As a consequence, the various dwellings types (i.e. Types 1, 2 and 3) provide storage, exclusive of the cupboards within the kitchens, ranging from 6.38 m^3 to 8.9 m^3.

I have previously opined that the supply of storage for each dwelling was appropriate and did not diminish the planning merit of the proposed development. The increase in the occupant storage, which now includes a combination of storage cages and storage within each residence for greater utility, further increases consistency with the Development Plan and overall planning merit.

Upon review of the additional information supplied, I reaffirm my opinion that the proposed multi-storey residential development displays substantial planning merit.

CATEGORISATION OF THE DEVELOPMENT:

I note that the proposed development is located within the Urban Corridor Zone (High Street 14.3 Policy Area) of the City of Norwood, Payneham & St Peters Development Plan and also comprises building work exceeding 4 storeys in total. For completeness, I also note that the subject site (i) is adjacent to land located within the Residential Historic (Conservation) Zone (Kent Town 2 Policy Area 12.2) to the north-east and (ii) is illustrated on Concept Plan Fig UrC/1 as a "Key Development Area".

Turning firstly to the Development Regulations, I note the following clause of relevance:

> **Schedule 10 – Decision by Development Assessment Commission**
> **4C—Inner Metropolitan Area—buildings exceeding 4 storeys**
> (1) Development that involves the erection or construction of a building that exceeds 4 storeys in height in—
> (a) any part of the area of the following councils defined in the relevant Development Plan as Urban Corridor Zone:
> (i) the Corporation of the City of Norwood, Payneham & St Peters…

Accordingly, the Development Assessment Commission is the relevant authority with respect to this application.

Having reviewed the Urban Corridor Zone I note that the proposal is not listed as a "non-complying" or a "complying" form of development and accordingly a "merit" assessment is required.

In relation to public notification, I note that the Urban Corridor Zone as per PDC 21 deems any type of dwelling and residential flat building as Category 1 with the exception of "land adjacent to a residential zone" which is "3 or more storeys in height". In this scenario Category 2 public notification is assigned.

THE SITE AND HISTORY:

The subject site, Allotment 25 in DP 49351, or more commonly known as 25 College Road, Kent Town is occupied by the former Bureau of Meteorology office (constructed circa. 1977). The structure was "purpose built" for the functions performed by the Bureau of Meteorology, however with the automation of weather stations a substantial reduction in staff was experienced, which then precipitated the relocation of a majority of the functions to a new CBD location in 2015.

The land and buildings were deemed surplus to needs and subsequently sold. At the same time the office was rendered vacant and remains as such. I am not aware of any potentially contaminating activities that may have occurred on the land.

Returning to the Certificate of Title, I note that the allotment is irregular in shape with an area of approximately 3400 m^2 with frontages to College Road of 56.69 m and a frontage to Little Young Street of 90.7 m. The southern eastern boundary dimension is 48.34 m, while the north-western boundary is 19.11 m in length.

On review, the "footprint" of the former Bureau of Meteorology "sits" in an "L" shape in the southern corner of the site, with the northern corner currently occupied by an informal landscaped area (I understand that no regulated trees are evident on the land). The narrower section of the allotment to the western segment (frontage only to Little Young Street is disposed of as a car parking area that serviced the original Bureau of Meteorology building).

The existing building comprises 4 levels and approximately 2,550 m^2 of floor area. The built form presents as a strong vertical building to a height of 15.5 m as measured from the Little Young Street road reserve. Additionally, the building displays "heavy" pre-cast segments which from some aspects appear as quite forbidding in comparison to the more low scale building mass adjacent to the site. I also note that the building is located on or very close the Little Young Street frontage, which when combined with the narrowness of the road reserve creates, in my opinion, an "uninviting" streetscape.

The subject site displays a generally even fall from College Road to Little Rundle Street, and includes the following "level changes":

- a top of kerb from College Road on average of 47.17;
- a "drop" in level within 2 m from the mid-point of the College Road frontage of approximately 3 m;
- a slope from the northern corner of the site adjoining College Road from 47.11 to 45.08 in a southerly direction for 18 m;
- a sharp "drop off" of approximately 1.4 m over 2 m in the same southerly direction;
- the majority of the remainder of the site being set at a level of 44.08 as created by the existing building floor level and access ways;
- a further 500 mm (on average) fall from the existing building related ground level to the Little Young Street frontage; and
- the current car parking area with an even gradient from the eastern most boundary to Little Young Street of approximately 1.35 m over the 19.11 m depth of this portion of the site.

I also note that adjoining land uses can be summarised as including.

- single building occupied as a light industry (metal work) at 44 The Parade West;
- two storey office building located at 27 College Road;
- single storey restaurant and function centre located at 36 to 43B Fullarton Road;
- single storey dwelling located at 34 College Road;

- single storey dwelling located at 32 College Road;
- four storey residential flat building (comprising 9 dwellings) at 30 College Road;
- single storey residential flat building (comprising 4 dwellings) at 26 College Road;
- single storey dwellings located at 24 and 22 College Road;
- singe storey medium density dwellings located at 15 to 17 College Road;
- residual Bureau of Meteorology measuring station on College Road adjoining the site (largely vacant land);
- single storey dwelling located at 12 Grenfell Street;
- two storey residential flat building ("Carmen House") comprising four accommodation units at 10 Grenfell Street;
- single storey offices located at 2 to 8 Grenfell Street;
- motor repair station and storage located on the corner of Little Young Street and Grenfell Street;
- two storey office building located 26 The Parade West (with frontage to Little Young Street) and associated car park on the opposing side of Little Young Street;
- a car parking and storage facility associated with Prince Alfred College located at 32A The Parade West (with frontage to Little Young Street), and
- a single storey retail showroom located at 36 The Parade West.

I note that the land at 32A to 36 The Parade West has been the subject of a recent decision to granted Development Plan consent (DA 155/M007/16) for a boarding house facility by Prince Alfred College. I understand that the approved development is to compromise 5 storeys and incorporate an "arrow head" shaped building with pedestrian bridge over The Parade West.[2]

THE PROPOSAL:

Generally, this application seeks Development Plan consent to (a) demolish the existing structures on the land and (b) construct a multi-storey residential development comprised of common ground floor incorporating 85 car parks, 54 bike parks and storage, three residential flat buildings including 19 dwellings, 26 dwellings and 25 dwellings over 5 storeys, 7 storeys and 6 storeys respectively, 8 two storey row dwellings and communal open space and pedestrian access ways.

Additionally, the application identifies various stages associated with the future construction of the development (for example; demolition, sub-structure, super-structure, residential flat buildings, row dwellings, communal open space).

In the absence of a proposed plan of division; the eight College Road facing dwellings have been referred to as row dwellings as I understand that each dwelling will largely "hold" an exclusive site area and will not be linked by way of tenure or management regimes to the ground floor area or the communal open space areas.[3]

[2] For the purposes of my assessment I have assumed that the approved development will proceed (noting also that the Pruszinski Architects drawings have also modeled the relevant details). Should however the sites at 32A – 36 The Parade West remain "as is" my planning opinion expressed herein would not alter given the current built form and nature of land uses on that land.

[3] Should minor utilities or infrastructure servicing the 8 dwellings encroach into the underfloor area I am of the opinion that this should not alter the fundamental description of the College Road facing dwellings as "row dwellings".

OVERVIEW:

Key characteristics of the dwellings and the various floor levels include:

Row Dwellings (frontage to College Road)

- two storey;
- open plan living, meals and dining, garage and wet areas on ground level;
- three bedrooms and wet areas at the upper level;
- additional visitor car park located in the driveway;
- rear "facing" and balcony private open space (30 m^2 to 31 m^2);
- screened courtyard adjacent the College Road frontage;

Ground Floor

- vehicular entry via Little Young Street;
- separated pedestrian entry via Little Young Street;
- car parking spaces totalling 85 spaces;
- bike parking totalling 34 spaces;
- dedicated areas for refuse storage and collection;
- general storage;
- access to three lifts to service each of the above ground residential flat buildings;
- dedicated areas for relocation of the existing electricity transformer adjoining the Little Young Street frontage;
- secure viewable bicycle storage areas and external bike parking adjacent to entry for the north-western residential flat building;
- "public" seating interspersed between feature block work screen wall;
- glazing to south-eastern corner of the building to provide for future "activation";
- a pedestrian footpath on the subject site to supplement to the public road reserve;

I note that the ground floor plan illustrates an option for the three southern most car parks and associated aisle to be replaced with a potential office with glazed facade facing Little Young Street. I understand that this does not form part of this application, however the floor plan does illustrate an "adaptive re-use" that could be adopted in the future.

North-Western Residential Flat Building

- five storey, comprising a total of 19 dwellings;
- ground floor direct access from Little Young Street to residential lobby;
- a ground floor comprising 2 three bedroom dwellings (ranging in internal floor areas of 81 m^2 to 85 m^2) with ground level private open space (ranging in areas of 42 m^2 to 60 m^2);
- a ground floor comprising 1 single bedroom dwelling (internal floor area of 56 m^2) with level private open space (area of 27 m^2);
- first floor comprising 3 two bedroom dwellings (ranging in internal floor areas of 81 m^2 to 85 m^2) with balcony private open space (ranging in areas of 11 m^2 to 24 m^2) and 1 single bedroom dwelling of 63 m^2 internal floor area and private open space of 30 m^2;
- second floor comprising 3 two bedroom dwellings (ranging in internal floor areas of 81 m^2 to 85 m^2) with balcony private open space (ranging in areas of 11 m^2 to 14 m^2) and 1 single bedroom dwelling of 63 m^2 internal floor area and private open space of 7 m^2;
- third floor replicating the second floor;
- fourth floor replicating the third floor;
- each dwelling incorporates an open plan living, dining and meals area and associated wet areas;
- passive sunshading devices to west and north facing windows and balconies;

"Middle" Residential Flat Building

- six levels above the basement ground floor (total of seven storeys), comprising a total of 26 dwellings;
- ground floor direct access from Little Young Street to the lobby which services the middle and south-eastern residential flat building;
- first floor comprising 2 two bedroom dwellings (ranging in internal floor areas of 76 m^2 to 83 m^2) with private open space at ground/terrace level (ranging in areas of 31 m^2 to 34 m^2) and 3 single bedroom dwellings (ranging in internal floor areas of 53 m^2 to 62 m^2) with private open space ranging from 13 m^2 to 48 m^2;
- second floor comprising 2 two bedroom dwellings (ranging in internal floor areas of 76 m^2 to 83 m^2) with private open space at balcony level of 12 m^2 and 3 single bedroom dwellings (ranging in internal floor areas of 53 m^2 to 62 m^2) with private open space ranging from 9 m^2 to 12 m^2;
- third floor comprising 4 two bedroom dwellings (ranging in internal floor areas of 76 m^2 to 98 m^2) with private open space at balcony level (ranging in areas of 12 m^2 to 34 m^2);
- fourth floor replicating the third floor;
- fifth floor replicating the fourth floor;
- sixth floor replicating the fifth floor;
- each dwelling incorporates an open plan living, dining and meals area and associated wet areas;
- passive sunshading devices to west and north facing windows and balconies;
- solid balustrading to balconies to minimise overlooking and limit wind effects;

South-Eastern Residential Flat Building

- six levels above the basement ground floor (total of seven storeys), comprising a total of 26 dwellings;
- ground floor direct access from Little Young Street to the lobby which services the middle and south-eastern residential flat building;
- first floor comprising 4 two bedroom dwellings (ranging in internal floor areas of 76 m^2 to 92 m^2) with private open space at ground/terrace level (ranging in areas of 9 m^2 to 19 m^2) and 1 single bedroom dwelling with a floor area of 62 m^2 with private open space of 12 m^2;
- second floor replicating the first floor;
- third floor comprising 5 two bedroom dwellings (ranging in internal floor areas of 76 m^2 to 92 m^2) with private open space at balcony level (ranging in areas of 9 m^2 to 19 m^2);
- fourth floor replicating the third floor;
- fifth floor comprising 5 two bedroom dwellings (ranging in internal floor areas of 76 m^2 to 92 m^2) with private open space at balcony level (ranging in areas of 9 m^2 to 19 m^2);
- each dwelling incorporates an open plan living, dining and meals area and associated wet areas;
- passive sunshading devices to west and north facing windows and balconies;
- solid balustrading to balconies to minimise overlooking and limit wind effects;

Residential Flat Building Roof Levels

- each roof level incorporates lift and screened areas for plant servicing each building.

BUILT FORM AND DESIGN (GENERAL OVERVIEW):

The development presents as three separate but related dwellings to Little Young Street and more conventional two storey dwellings to College Road. Additionally the row dwellings and three residential flat buildings "work with" the various ground levels so as to create defined entry levels for each dwelling and create visual interest at street level.

The design and selection of materials for the residential flat buildings clearly reference the contribution made to the streetscape and the locality by the Bureau of Meteorology office, the geometric forms of buildings, the prevalence of brick work and discernible glazing and frames.

The adaptation of these materials into the façades for the residential flat buildings, coupled with the "woven" podium brick work, central pillar like entry columns to the communal open space areas (sympathetically referencing the Bureau of Meteorology building), contrasting horizontal balcony and terrace levels associated with the dwellings and high percentage of "corner apartments" results in a development that presents as well conceived and complementary to the streetscape and locality.

From discussion with Pruszinski Architects, it is evident also that the scheme has developed material hierarchy based on the aesthetic and language of the locality. The podium and street walls comprise raw honest materials that reference the context of small scale texture (e.g. bricks, blocks, stone pieces). The upper floors compromise contemporary materials that are complementary to the podium and reference the local context with simple lines, banded plans and ribbons of dark glass.

Additionally, the three residential flat buildings avoid monotonous building facades (to all elevations") and a high degree of spaciousness between the residential structures. When combined with the "expansion" of the road reserve by the introduction of the foot path, bike parking and seating (adjacent to the clearly defined podium) the development delivers additional "depth" and visual interest as viewed from public land.

The communal open space areas to provide further personal refuge and access areas, while creating adaptable and functional areas which serve to promote interaction between residents and visitors, while also reinforcing the articulation of the built form. The communal open space also creates a day time "direct route" between College Road and Little Young Street. The permeability of the site further enhances connectivity between the public real and enables elements of the residential flat buildings to be incorporated sympathetically and appropriately into the row dwellings.

In this regard the row dwellings repeat the brick work into the domestic scale front fencing to College Road and the render associated with the facades.

I also note that the row dwellings incorporate landscaped front courtyards that allow views into the public realm, while the garaging forms a recessive component of the built form (noting the greater set back to College Road and balcony projecting forward over the visitor car parking area).

As was the case with residential flat building, the interface with College Road has been well considered with the fencing, building set backs and opportunities for passive surveillance and social interaction ensuring that the development interacts with and complements the streetscape and locality characteristics.

THE LOCALITY:

The locality comprises main characteristics which include:

- the residential use and variety of accommodation types to College Road;
- the restaurant, function centre and office uses located on College Road adjacent to The Parade West and Fullarton Road;
- the mix of short term accommodation and offices uses to the north-western end of College Road and Grenfell Street; and

- the commercial activities adjoining to the site to the north-west along Little Young Street and to the south-eastern corner (light industrial activities).

I note at this stage that the architectural styles of dwellings are highly varied, and while the north-eastern side of College Road is "zoned" Residential Historic (Conservation) I am of the opinion that the desired character has been "lost" to sequential and regular "non-heritage" development.

As previously mentioned it is reasonable to anticipate that the locality will also incorporate the 5 storey PAC boarding house facility and link bridge directly to the south and south-west of the subject land.

Built form heights range from single storey to five storey, while buildings range in age from early 1900's to mid-2000's. It is self evident that the new PAC boarding house facility will introduce a contemporary building with greater scale and presence that the existing 3 storey gymnasium facility more recently constructed by the school.

The locality also experiences a "tone" associated with the high-use road network, which results in a perception and reality of an urbanised context which is well served by public transport and easy access to the City (given the city-fringe proximity).

The amenity of the locality is moderate.

PLANNING ASSESSMENT:

I have assessed the development proposal against the relevant provisions of the City of Norwood, Payneham & St Peters Development Plan as consolidated on 28 April 2016 and I am of the opinion that the application is one which is appropriate for the site and the locality. The following provisions are relevant when considering the application.

THE DEVELOPMENT PLAN:

CITY WIDE:

Objectives 1, 5, 7, 8, 10, 18, 19, 20, 22, 23, 24, 25, 26, 34, 37, 41, 42, 44, 46, 55, 57, 59, 60, 61, 63,
Principles of Development Control 1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 28, 30, 31, 32, 33, 36, 37, 38, 39, 40, 41, 42, 45, 46, 48, 50, 51, 53, 54, 55, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 73, 78, 79, 80, 81, 86, 92, 93, 95, 98, 100, 101, 104, 105, 109, 110, 112, 113, 118, 119, 120, 123, 124, 129, 130, 132, 134, 135, 137, 138, 141, 147, 148, 149, 151, 155, 174, 175, 176, 180, 181, 182, 184, 222, 225, 226, 227, 234, 243, 260, 261, 262, 263, 264, 265, 267, 268, 269, 270, 272, 272, 273, 274

AFFORDABLE HOUSING OVERLAY:

Objective 1
Principle of Development Control 1

NOISE AND AIR EMISSIONS OVERLAY:

Objective 1
Principle of Development Control 1

URBAN CORRIDOR ZONE:

Desired Character
Objectives 1, 2, 4, 5, 6, 7, 8
Principles of Development Control 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 20, 21

HIGH STREET POLICY AREA:
Desired Character
Objectives 1, 2, 3, 4, 5, 6
Principles of Development Control 1, 2, 3, 4, 5, 6, 7, 8

RESIDENTIAL HISTORIC (CONSERVATION) ZONE:
Desired Character
Objective 5
Principles of Development Control 2, 13

EDUCATIONAL ZONE:
Prince Alfred College Policy Area
Objectives 1, 2
Principles of Development Control 7, 8, 9

For the sake of brevity, this statement has grouped the above provisions into key topics and accordingly, my opinion has been provided with respect to the following, (a) the appropriateness of the use, (b) the appropriateness of the dwelling density, (c) the appropriateness of the proposed building height, (d) the built form and set backs, (e) design and appearance, (f) open space and dwelling functionality, (g) the interaction with the public realm and adjoining land, (h) crime prevention through environmental design and (i) traffic access, safety and parking.

ASSESSMENT APPROACH:

Upon review of the Development Plan as a whole I am of the view that the more recent consolidations of the policies has lead to much duplication and some ambiguity between the zone and policy area specific guidelines and the City Wide provisions. The Development Plan attempts to reconcile the ambiguity and overlap by noting scenarios and offering guidance "except where varied by zone and/or policy area provisions". Substantial duplication and inconsistency however remains.

For example, numerous layers of policy relate to compatibility between proposed buildings and the existing built form.

At a City Wide level the general approach is to seek to achieve a transition and complementarities between building scale and design features. Within the High Street Area (and further Concept Plan Fig UrC/1) it is evident that employing design elements on new 5 storey plus buildings that complement single storey conventional dwellings is not likely to bring about the outcomes sought at the City Wide level.

Likewise, at a City Wide level the set backs of buildings from boundaries are to "similar to, or compatible with, the set backs of buildings on adjoining land" (see for example City Wide 50), however within the Urban Corridor Zone (where substantial change in density and form is anticipated and a new character is sought) an inconsistency will arise.

For all scenarios where such an inconsistency is evident, I have applied the assessment approach noted in *Town of Gawler v Impact Investment Corporation Pty Ltd* [2007] SASC 356 which states of relevance (my underlining added):

> 81. In order to determine whether a relevant Planning Authority or the ERD Court is justified in departing from a clearly expressed policy like principle 8, I consider that each of the following matters is relevant:…

> 2. Whether the relevant principle is in conflict with some other applicable planning principle. That is likely to happen only rarely, in which case the more specific principle may displace the more generally expressed principle;

Applying this approach will achieve an assessment outcome which is consistent with the guidance provided by the Court in *Alexandrina Council v Strath Hub Pty Ltd* [2003] SASC 382; (2003) 129 LGERA 389 (my underlining added):

> Nor is it any answer to ignoring the Objective and the Principles of Development Control to say that the Objective of the plan cannot be or is unlikely to be achieved. On the evidence before him it was not open to the Commissioner to make such a finding. But even if it were, it is not open to a planning authority to ignore the essential thrust and objective of the Plan.

Finally, I note that various provisions in the Development Plan pertain to stormwater management. Having reviewed the planning drawings, it is anticipated that the resolution of this issue will occur during the detailed assessment process and further supply of technical information (if requested). I have also considered documentation with respect to waste management statement and am of the view that the relevant provisions of the Development Plan will be achievable in this respect. Additionally, compliance of the proposed landscaping in relation to the Development Plan is largely self-evident.

Appropriateness of the Proposed Use

The proposed multi-storey residential development will result in a residential use (or combination of residential and non-residential uses if the adaptive re-use is employed) that is, in the first instance, consistent with the Urban Corridor Zone, see for example the following provision:

> URBAN CORRIDOR ZONE:
> **Objective 1:** A mixed use zone accommodating a range of compatible non-residential and medium and high density residential land uses orientated towards a high frequency public transport corridor.
> **Objective 2:** Integrated, mixed use, medium and high rise buildings with ground floor uses that create active and vibrant streets with residential and commercial development above.

In relation to Objective 2 I note that the proposed development does not specifically include a non-residential ground floor use, however the alternate use of 3 car parking spaces is demonstrated on PLA Sheet 02. While the preferred design is for an entirely residential development, it is apparent that Objective 2 can be accommodated, should demand so arise.[4]
In my opinion, Objective 2 should be viewed in the context of the anticipated PAC boarding facility and the current function and appearance of Little Young Street. In this regard buildings (both current and future) do not address the Little Young Street public realm and have resulted in a streetscape that is not inviting and suited to ground floor commercial type uses.

Additionally, Objective 2 is to be read in the context of the following specific provisions (my underlining added) which confirms that roads in the form of laneways are not intended to be activated in the same manner as desired "high streets".

[4] I note that should the car parking area be "adapted" for commercial use such an outcome would be consistent with the following provision:

High Street Policy Area
PDC 7 The ground floor of buildings should be built to dimensions including a minimum floor to ceiling height of 3.5 metres to allow for adaptation to a range of land uses including retail, office and residential without the need for significant change to the building.

Urban Corridor Zone
Objective 4: Adaptable and flexible building designs that can accommodate changes in land use and respond to changing economic and social conditions.

> HIGH STREET POLICY AREA
> **Objective 1:** A mix of land uses including retail, office, commercial, community, civic and medium and high density residential development that support the economic vitality of the area.[5]
>
> **Desired Character**
> Except within Area E (shown on Concept Plan Fig UrC/1), which provides greater development opportunities due to the size of the site and the topography of the land, the secondary streets, including Grenfell Street and College Road will provide opportunities for a lower intensity and scale of development than that found along the Primary Road Corridors.
>
> *Area E*
> Development will comprise either residential land uses or a mix of commercial and medium to high density residential development. Vehicle access should, where possible, be provided from Little Young Street.

In my opinion it is clearly intended that exclusively residential development is contemplated in "Area E" as assigned to the site, while vehicle access from Little Young Street (consistent with it vehicular service lane function) is sought.

Noting the consistency of the proposed development with the most specific guidance for the site (i.e. Area E) it is apparent that the multi-storey residential proposal also advances the following provisions:

> URBAN CORRIDOR ZONE:
> **PDC 1** The following types of development, or combination thereof, are envisaged in the zone:
> Dwelling
> Residential flat building
> **PDC 3** Development should be consistent with the desired character for the zone.
>
> HIGH STREET POLICY AREA:
> **PDC 3** Development should be consistent with the desired character for the policy area.

Returning to "Area E' as defined as a "Key Development Area" the density of occupancy sought serves to support the role and importance assigned to Kent Town by creating a high quality urban environment which will accommodate a resident population consistent with the 30 Year Plan and "feed" demand for the high street activities sought throughout the remainder of the High Street Policy Area. Accordingly, the proposed development is consistent with the Development Plan, see for example.

> URBAN CORRIDOR ZONE:
> **Desired Character**
> Within Kent Town, the Urban Corridor Zone will play a significant role in contributing to the overall population and employment targets for the Eastern Metropolitan Adelaide Region, which are set out in the 30 Year Plan for Greater Adelaide, by providing opportunities for the development of a high quality urban environment, which supports a mix of employment generating activities and medium to high density residential development

I also note that the proposed development will, as a consequence of the residential flat building design, the general density proposed, the diversity of housing design and use of existing public utilities, be consistent with the following broader policy outcomes:

[5] In this respect the density of occupancy proposed will serve to support existing and future non-residential development and contribute to the overall "mix" of uses consistent with Objective 1 of the High Street Policy Area regardless.

CITY WIDE:
Objective 1: Orderly and economic development that creates a safe, convenient and pleasant environment in which to live.
Objective 5: Development occurring in an orderly and compact form to support the efficient provision of public services and community facilities.
Objective 8: Compatibility of new buildings with the desired environment around them.

PDC 1 Development should be orderly and economic.
PDC 2 Development should:
(a) form a compact and continuous extension of an existing built-up area;
(b) be located to achieve economy in the provision and use of public services and infrastructure; and
(c) create a safe, convenient and pleasant place to live.
PDC 3 Development should take place on land which is suitable for the intended use of that land, having regard to the location and condition of that land and the provisions for the relevant Zone and Policy Area.

In my opinion, the fundamental intent of the Urban Corridor Zone and High Street Policy Area is addressed by the proposed development and it follows that numerous other City Wide provisions are additionally and appropriately resolved by the development, noting for example:

CITY WIDE
Objective 7: Rational distribution of land uses to avoid incompatibility between them.
Objective 60: Medium and high rise development that provides housing choice and employment opportunities.
Objective 61: Residential development that provides a high standard of amenity and adaptability for a variety of accommodation and living needs.
PDC 265 Buildings comprising more than 20 dwellings should provide a variety of dwelling sizes and a range in the number of bedrooms per dwelling.

Appropriateness of the Proposed Dwelling Density

The most specific reference to dwelling density is detailed in the following provision:

URBAN CORRIDOR ZONE:
PDC 5 Residential development in a wholly residential building should aim to achieve a target minimum net residential site density in accordance with the following:

Policy Area	Minimum net residential site density
High Street	70 dwellings per hectare

I note that the development proposes a building which is "wholly residential" (which again highlights that 100% residential development as that proposed is anticipated within the zone), while the Development Plan also seeks:

HIGH STREET POLICY AREA:
Desired Character
The zone will primarily support net residential densities of between 60 and 100 dwellings per hectare, with an overall likely yield of an additional 560 dwellings to be achieved by 2040. A minimum residential density target for wholly residential buildings is specified, in order to support the achievement of dwelling yield targets, which align with the *30 Year Plan*.

In my experience, the dwelling density per hectare is consistent with that expressed in the State Government publication *"Understanding Residential Densities: A Pictorial Handbook of Adelaide Examples November 2006"* ("Density Handbook") which describes high density allotments as those ranging from 141 m^2 to 4 m^2. The net density which is also expressed in the Density Handbook ranges from 71.2 dw/ha to 2305.9 dw/ha.

In this case the "average allotment area" would be in the order of 43 m^2 (if the total site area was simply divided by the number of dwellings) which is consistent with the Density Handbook description of "high density". In terms of the number of dwellings proposed, the ratio per hectare equates to approximately 230 which is consistent with PDC 5 of the zone.

As a consequence, the proposed development is also consistent with the following provision:

> CITY WIDE
> **PDC 5** Development should be undertaken in accordance with the Norwood Payneham and St Peters (City) Structure Plan, Map NPSP/1 (Overlay 1) Parts A & B.
> **PDC 6** Development should not take place excessively in advance of a demonstrated need for the use for which it provides.

Appropriateness of the Proposed Building Height

Returning to the Urban Corridor Zone the overall building heights are guided by the following provisions.

> URBAN CORRIDOR ZONE:
> **PDC 13** Except where airport building height restrictions prevail, or the interface height provisions require a lesser height, or where an alternative maximum building height is shown on Concept Plan Fig UrC/1, building heights (excluding any rooftop mechanical plant or equipment) should be consistent with the following parameters:[6]

Policy area	Minimum building height	Maximum building height
High Street	3 storeys or no less than 11.5 metres	5 storeys and up to 18.5 metres

> HIGH STREET POLICY AREA:
> **PDC 4** Buildings should maintain a pedestrian scale at street level, and should:
> (a) include a clearly defined podium or street wall with a maximum building height of 2 storeys or 8 metres in height; and
> (b) have levels above the defined podium or street wall setback a minimum of 3 metres from that wall.

> HIGH STREET POLICY AREA:
> **Desired Character**
> *Area E*
> Area E, shown on Concept Plan Fig UrC/1, provides an opportunity for development of up to five (5) storeys, except along the College Road frontage, where development will be limited to two (2) storeys. Taller building elements will be located within the western portions of the site, where the natural ground level is lower than the eastern portions of the site.

In the first instance, I note that the a "clearly defined podium" is provided to Little Young Street in accordance with PDC 4 of the High Street Policy Area. It is also the case that the dwellings along the College Road frontage are limited to two storeys as per the desired character for Area E.

Upon review PDC 13 and Area E of the zone and policy area appear to provide somewhat conflicting policy direction. In this regard PDC 13 sets a 5 storey and 18.5 m height "allowance" for the entirety of the zone. More specifically Area E continues to provide an opportunity for development of up to 5 storeys, however then describes that "taller building elements will be located within the western portions of the site, where the natural ground level is lower than the eastern portions of the site".

[6] I note that the airport height restrictions are not exceeded by the proposed development.

In my opinion, the recognition of taller buildings on the western portion of Area E is a reflection of the natural topography which effectively results in the top of kerb level on Little Young Street relative to the top of kerb on College Road being approximately 1½ to 2 storeys lower in "height". As a result a 5 storey building in the "centre" of Area E will logically "project out" to 6 to 7 storeys in height as the gradient of the land continues to fall towards Little Young Street.

This recognition of the taller building elements is reflected in the proposed building form which adopts a 5 storey building on the north-western portion (which is generally less sloping) and 6 and 7 storey buildings in the middle and south-eastern portions of the site (which experiences greater change in the topography).

Furthermore, I note that the desired character of the Zone seeks as follows (my underlining added):

> URBAN CORRIDOR ZONE:
> **Desired Character**
> The zone will primarily support net residential densities of between 60 and 100 dwellings per hectare, with an overall likely yield of an additional 560 dwellings to be achieved by 2040…
> It is recognised that not all development sites will have the capacity to contribute to the overall dwelling yield target, due to the fact that development will be required to satisfy a range of design requirements, (such as the provision of on-site car parking, building height and set-backs) which may, particularly on smaller sites, be prohibitive to achieving the desired density outcomes.

Unlike small development sites, the subject land (with the area site area and dual street frontages) is ideally suited to "make up" for other area within the zone that cannot contribute to the additional housing growth in Kent Town. It is appropriate in the circumstances that the higher dwelling yield be achieved by the addition of one storey and two storeys for the south-eastern building and middle building respectively. I am also of the opinion that such an approach supports and is consistent with the "key development area" status assigned specifically to the site by Fig UrC/1.
While the additional building height is sensible and supported by the Development Plan, in my opinion, I am also cognisant of the clear guidance provided in the matter of *AG Building and Developments Pty Ltd v City of Holdfast Bay & Tanti* [2009] SASC 11 which states:

> "…it does not follow that because some minimum quantitative standards or guidelines are not met, the proposal must be rejected."

The Court further describes the correct approach:

> "It required an assessment not of particular issues in watertight compartments, but rather as part of a single complex planning problem – whether the proposal as a whole should be approved."

Accordingly, a building height above 5 storeys (which I consider is supported in any event) need not automatically prove "fatal" to the merit of the compromise proposal.

In my opinion when considering the development "as a whole" (noting the further discussion to follow) the overall building height is entirely appropriate and displays substantial planning merit.

Built Form and Set Backs

Noting that the site is adjacent to land within in a different zone, PDC 14 of the Urban Corridor Zone (by way of Figure 1) sets a 30 degree plane for the building envelope from the zone boundary. In this regard I note that the zone boundary is located on the north-eastern side of College Road and accordingly the building envelope is already set back from the development site the width of the road reserve (approximately 20 m).

When coupled with the proposed two storey dwellings to adjoin College Road and the effective set back of the residential flat buildings to College Road the development well exceeds the separation and interface transition anticipated between zone boundaries.

At this point I also consider that having regard to the range of "non-heritage" buildings along College Road (and lack of contributory items) that the building form and set backs will not "offend" or diminish the historic character of the streetscape. In this regard I recall the decision of *Yuile & Anor v The City of Unley & Anor* [2009] SAERDC 55 which stated of relevance:

> "The historical and factual context upon which a development "sits" is a key consideration The Development Plan is a guide in that task; its provisions are not mandatory: *St Ann's College Inc. v the Corporation of the City of Adelaide and Renton* [1999] SASC 479… In the *City of Unley v Hall* [2002] SASC 143 at [54], Besanko J. made clear that there may be a number of factors relevant to the assessment of proposed development, apart from whether the development is consistent with the overall intent, purpose and desired character of the zone.

In this instance the existence of residential flat buildings (up to 4 storey) and mid-century dwellings serves to create a context that is "accepting of" the proposed built form and set back to College Road.

In relation to street frontage set backs and set backs more generally, I note that the Development Plan offers numeric guidance by way of Urban Corridor Zone PDC 15 (2 m to College Road) and PDC 16 (500 mm to Little Young Street). In both instances, I note that the proposed buildings achieve these guidelines. I also note that the Little Young Street set back exceeds the minimum so as to provide public realm treatments that address the following Development Plan provisions:

> URBAN CORRIDOR ZONE:
> **Desired Character**
> Cycling is an increasingly popular form of transport and recreation, therefore development on public and private land will consider the needs of cyclists, in terms of providing secure bicycle parking and storage facilities.
>
> CITY WIDE:
> **PDC 182** Multi-unit development (greater than 10 dwellings) on large sites should address both the public and private realm through the inclusion of public art, good urban design and landscape features

Finally, I note that the High Street Policy Area does not "set" a minimum side boundary set back, and accordingly the articulated built form and side boundary set back provided where relevant do not offend the Development Plan and result in a development which creates space around buildings and a transition to adjoining development consistent with the following provisions:

> URBAN CORRIDOR ZONE:
> **Objective 5:** A built form that provides a transition down in scale and intensity at the zone boundary to maintain the amenity of residential properties located within adjoining zones.
>
> CITY WIDE:
> **PDC 33** Buildings should be designed and sited to avoid creating extensive areas of uninterrupted walls facing areas exposed to public view.
> **PDC 46** Development adjacent to the boundary of a Residential Historic (Conservation) Zone, should provide a transition down in scale and mass to complement the built form within the Residential Historic (Conservation) Zone.
> **PDC 50** The setback of buildings should:
> (b) contribute positively to the existing or desired streetscape character of the locality; and
> (c) not result in or contribute to a detrimental impact upon the function, appearance or character of the locality.

In my opinion, the general scale, boundary set backs and number of storeys again advance the policy guidance provided by the Development Plan.

Design and Appearance

In a design sense the Development Plan seeks outcomes such as a high level of building articulation, modulation of materials/colours/textures, activated building facades at ground level, maximisation of views over public land and creation of buildings which create visual interest. Relevant policies guiding building design and appearance include:

> URBAN CORRIDOR ZONE:
> **Desired Character**
> New development will exhibit architectural merit, which favours contemporary leading edge design, particularly along the prominent Boulevard Policy Area frontages and in gateway locations.
>
> HIGH STREET POLICY AREA:
> **Objective 2:** Buildings sited to provide a continuous and consistent built edge with verandahs/ awnings over the public footpath and an intimate built scale, with fine-grained detailing of buildings in the public realm.
> **Objective 3:** An interesting and varied skyline as viewed from the street and afar, provided by modulation in roof forms and the use of parapets.

Having reviewed the proposal drawings, and as per my previous general overview of the building form and design it is apparent that the development offers a well conceived design which reinforces the attributes of both the College Road and Little Young Street interfaces, along with the overall theme associated with Kent Town.

As a consequence (noting the respectful materials palette) and the interaction with the public realm, I am of the opinion that the development will appear as well articulated, not monolithic and appropriate for the key development area.

Additionally, the construction of 8 row dwellings and three residential flat buildings (each well spaced and with related but individual design characteristics) will clearly achieve architectural excellence.

Furthermore, the proposed development will integrate with and complement the 5 storey PAC boarding house facility, which I consider will combine to reinforce the focus and role anticipated for Kent Town more generally.

It is evident in my opinion that the development "exhibit[s] architectural merit, which favours contemporary leading edge design".

It is also the case that the propensity of corner apartments, balconies and separation distances provided by the communal open space areas serve to favourably resolve the following provisions (my underlining added):

> CITY WIDE:
> **Objective 19:** Development of a high architectural standard and appearance that responds to and reinforces positive aspects of the local environment and built form.
> **Objective 20:** Architectural excellence allowing for design innovation consistent with sound design principles.
>
> **PDC 4** Development should take place in a manner which will not:
> (b) prevent the attainment of the objectives for that other land.

PDC 28 The appearance of land and buildings should not impair the amenity of the locality in which they are situated.
PDC 30 Buildings should be designed to minimise their visual bulk and provide visual interest through design elements such as:
(a) articulation;
(b) colour and detailing;
(c) materials, patterns, textures and decorative elements;
(d) vertical and horizontal components;
(e) design and placement of windows;
(f) window and door proportions;
(g) roof form and pitch;
(h) verandahs and eaves; and
(i) variations to facades.
PDC **79** Fences and walls, including retaining walls, should:
(b) be compatible with the associated development and with existing predominant, attractive fences and walls in the locality;
PDC 262 Entrances to multi-storey buildings should:
(a) be oriented towards the street;
(b) be clearly identifiable;
(c) provide shelter, a sense of personal address and transitional space around the entry;…

Accordingly, I am of the opinion that the design and appearance of the development is cognisant of and consistent with the relevant provisions of the Development Plan.

Open Space and Dwelling Functionality

I note that the dwellings range from single bedroom to two bedroom "layouts". Each dwelling gains direct access to private open space provided as a terrace, deck or balcony and all include habitable rooms that gain direct access to natural light. The open plan kitchen/meals/family rooms for each residence have direct access to the balcony areas, further advancing the relationship with natural light and ventilation.

The dwellings also incorporate reduced amounts of glazing to the west facing facades, while seeking to maximise solar penetration to remaining facades, while cross ventilation is maximised by the very proportion of corner apartments.

Accordingly, I am of the opinion that the dwelling design addresses appropriately the following provisions (and numerous other similar guidelines not repeated for brevity):

CITY WIDE:
Objective 23: Development designed and sited to conserve energy and minimise waste.
Objective 63: Buildings designed and sited to be energy and water efficient.[7]

PDC 67 Development should provide for efficient solar access to buildings and open space all year round.
PDC 68 Buildings should be sited and designed to ensure:
(a) that the main living areas and the private open space associated with the main living areas, face north to maximise exposure to winter sun; and
(b) adequate natural light and winter sunlight is available to the main internal living areas and principal private open spaces of adjacent properties.

[7] Noting also the energy rating for the buildings as quoted by TMK:

"With the glazing and insulation proposed, the star ratings demonstrate that not all apartments achieve a minimum of 5 stars and however, collectively they achieve a star rating of not less than 6 stars)"

With respect to the supply of storage areas for each dwelling, I note that the Development Plan seeks as follows:

> CITY WIDE:
> **PDC 271** Each dwelling within a multi-storey building should provide a covered storage area of not less than 8 cubic metres in one or more of the following areas:
> (a) in the dwelling (but not including a habitable room);
> (b) in a garage, carport or outbuilding; or
> (c) within an on-site communal facility.

Put another way, the Development Plan "counts in" storage it is not located within a habitable room. The Development Plan does not define the term "habitable room" and the only comparable definition, in my opinion, is found in Schedule 4 of the Development Regulations as called up by the Residential Code provisions.

While this is not directly transferrable, the definition below provides a useful guide (in the absence of others), my underlining added;

> **habitable room** means a room used for domestic activities but does not include a bathroom, laundry, hallway, lobby or other service or access area or space that is not occupied for extended periods;

Applying the same definition to the proposed development it is apparent that the 8 row dwellings "comply" in full. Likewise, the Type 3D apartments (5 of) are commensurate with the PDC 271 guideline given the storage space of 7.69 m^3.

This leaves the additional "in basement" storage to be shared with the 65 apartments, i.e. 2.35 m^3 per dwelling. On review the number of apartments that comply in full or are very near to the 8 m^3 guideline amounts to 28.5%.

Accordingly, "compliant" storage is achieved for 46% of dwellings. Of the remaining dwellings it is important to note that PDC 271 should also be considered in the context of the quality of storage and the frequency of use of some storage. For example, overleaf some indicative kitchen layouts and robe designs are illustrated – See Figures 1, 2, 3 and 4.

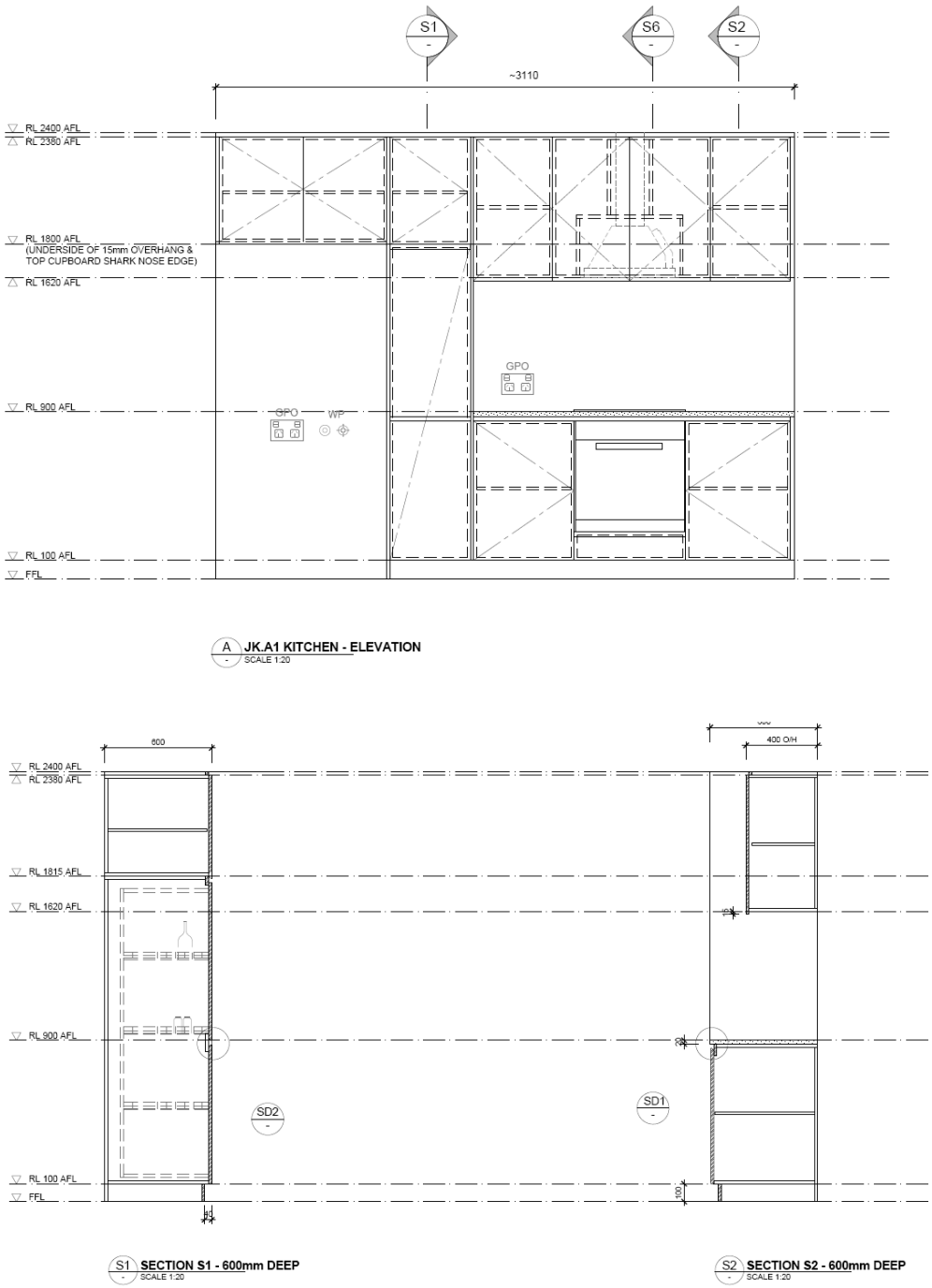


Figure 1: Typical Storage for "small" kitchens

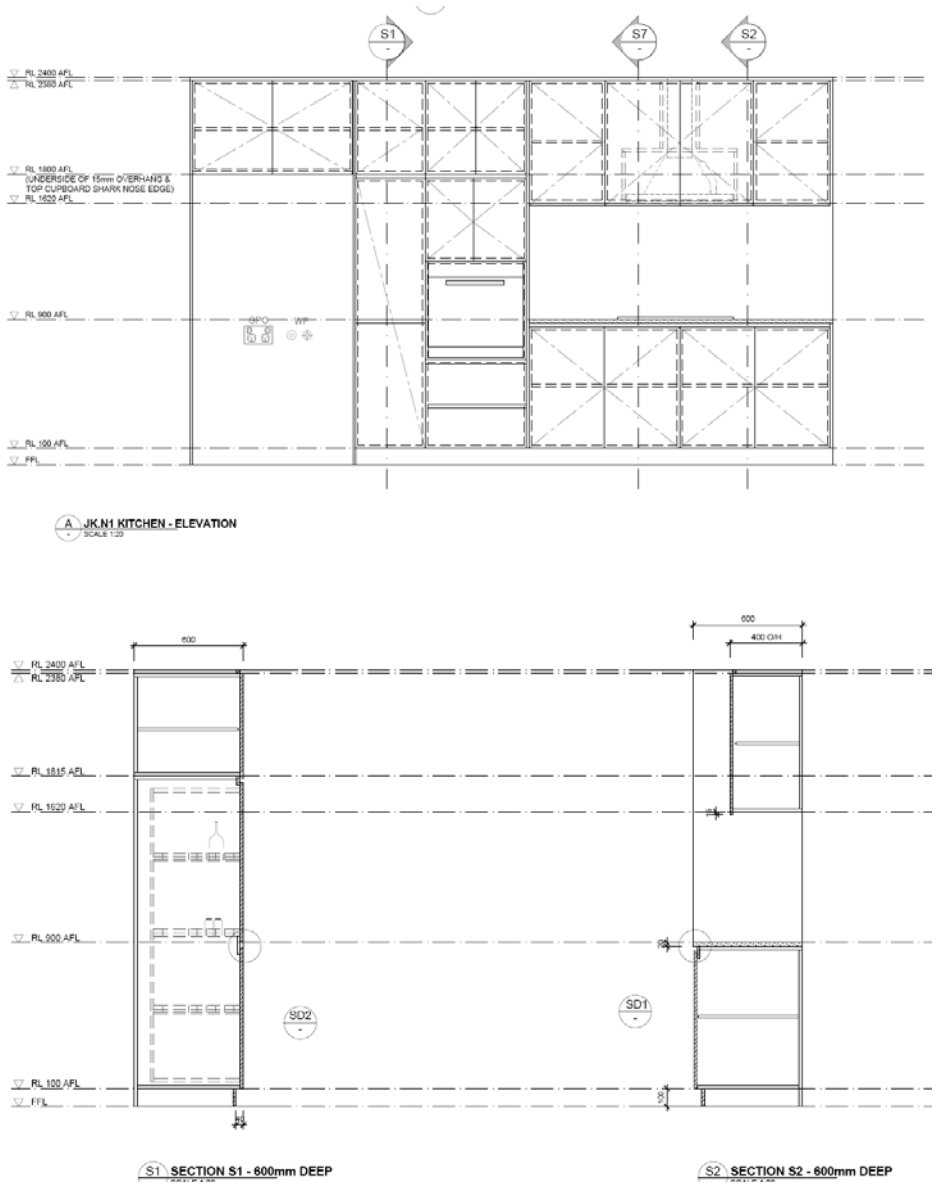


Figure 2: Typical Storage for "large" kitchens

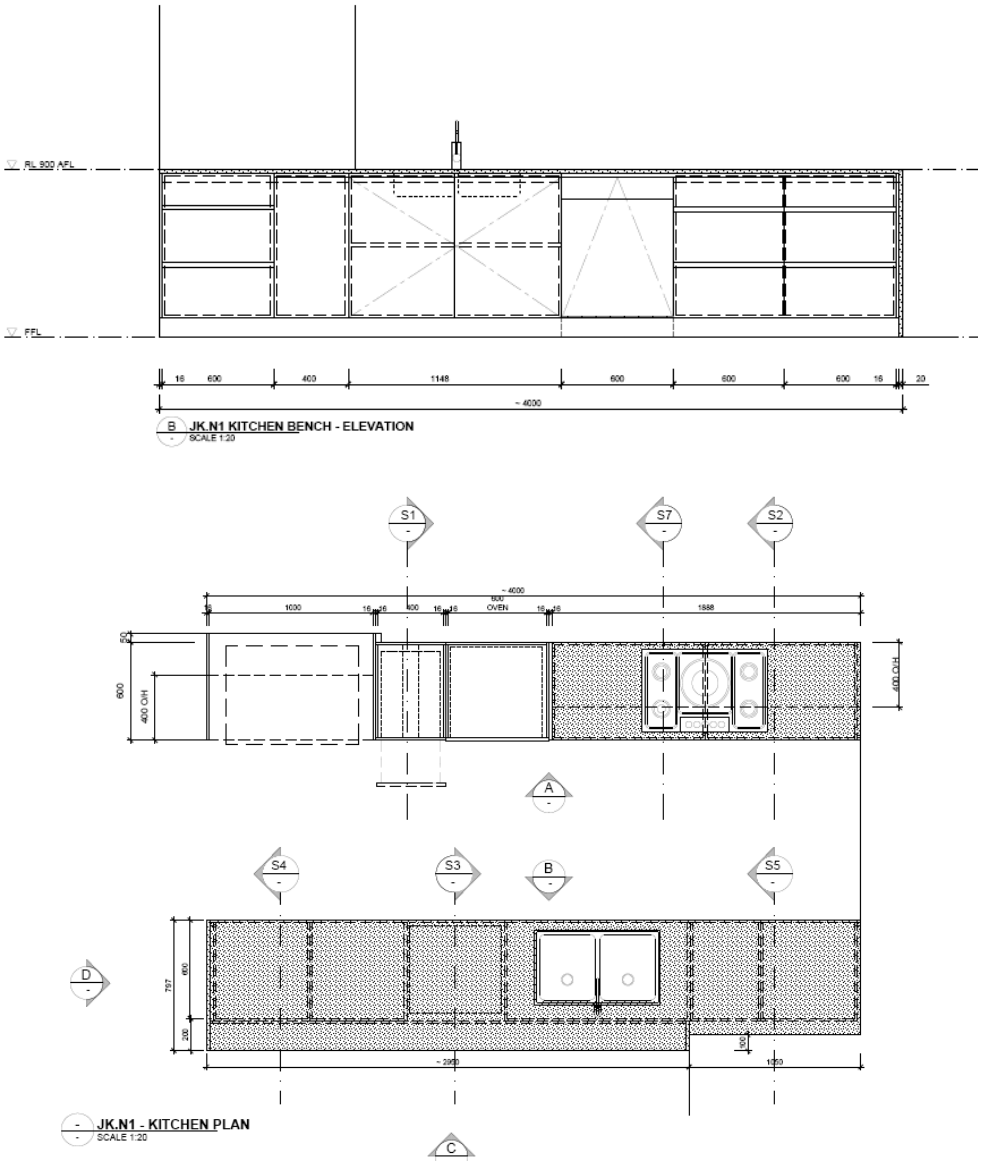


Figure 3: Typical Kitchen Island Bench Storage

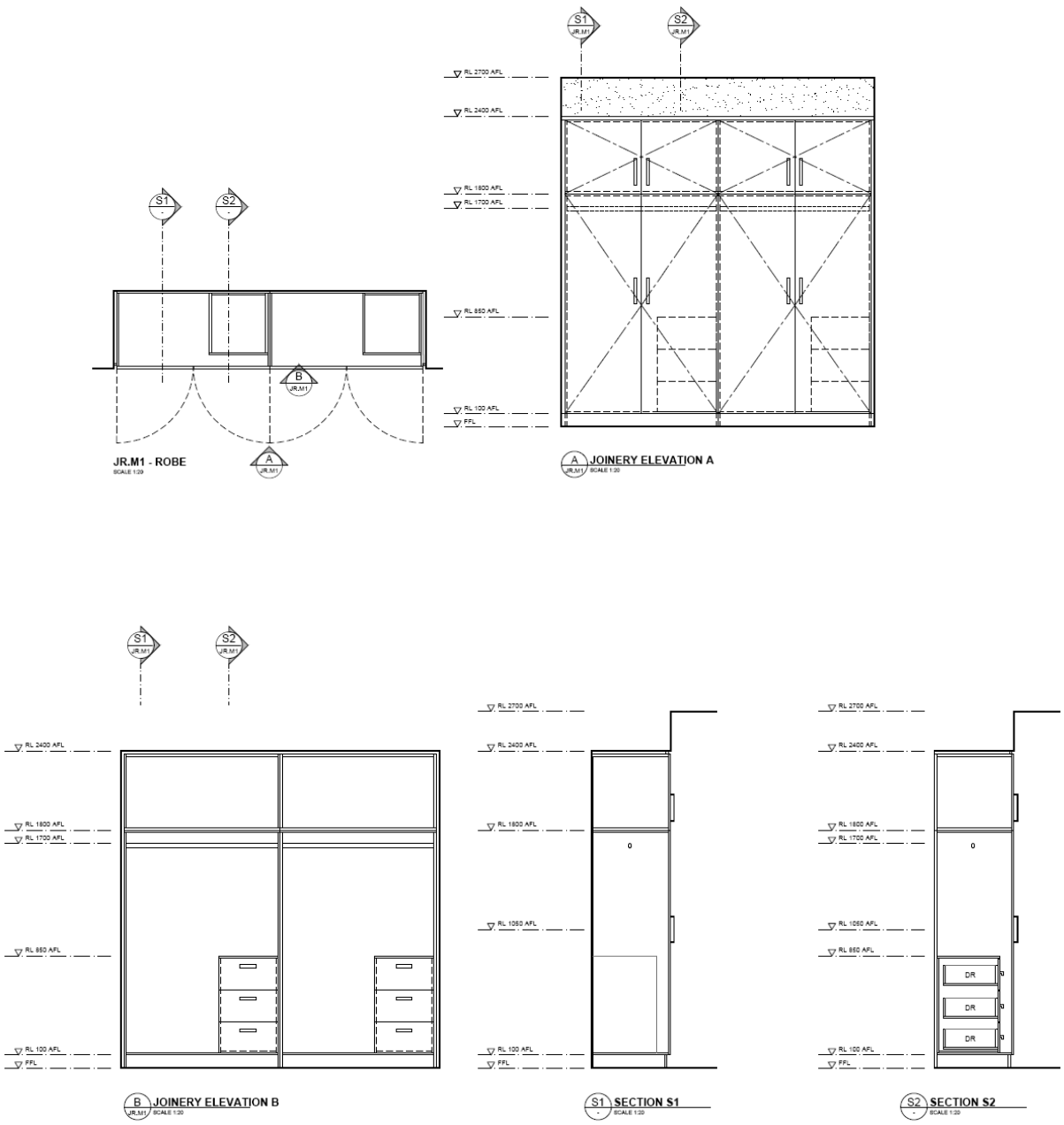


Figure 4: Typical Robe Design

It is apparent that the provision of cabinetry to the ceiling level and the extensive under bench cabinets provides additional storage which would not always be provided for one and two bedroom apartments. In my opinion, the upper and under bench level storage will supplement the storage areas already set aside so as to achieve adequate areas for the needs of future occupants.

Accordingly, the proposed storage areas do not diminish the overall planning merit of the development.

Turning to the supply of private open space, I note that the Development Plan by way of City Wide PDC 222 seeks a minimum 8 m^2 balcony or 10 m^2 deck or terrace (as relevant). Each dwelling is supplied with private open space in excess of these guidelines.

Additionally, City Wide PDC 226 seeks 10 m^2 of private open space for one bedroom residences and 12 m^2 of private open space for two bedroom residences, noting also that City Wide 225 seeks 35 m^2 of private open space for the row dwellings.

I note that all private open space areas are commensurate with or in excess of the above mentioned provisions. It is also the case that all dwellings will make use of the substantial area of communal open space as supplied. As a consequence, the development achieves compliance with the following provisions (my underlining added):

> CITY WIDE:
> **PDC 225** Dwellings (other than residential development in the form of apartments within a multi storey building) should have associated private open space of sufficient area, shape and gradient to be functional and capable of meeting the likely needs of the occupant…
> **226** Residential development in the form of apartments within a multi storey building should have associated private open space of sufficient area and shape to be functional and capable of meeting the likely needs of the occupant(s)…
> **PDC 227** A lesser amount of private open space may be considered in circumstances where:
> (a) the equivalent amount of private open space is provided in the form of communal open space, which is accessible to all occupants of the development;

Finally, in relation to the impact of noise and air emissions (associated with the Development Plan Overlay) the incorporation of the recommendations by Sonus into the dwelling designs will ensure that the amenity of future residents is not compromised.

Interaction with the Public Realm and Adjoining Land

As previously discussed the presentation of an activated façade to Little Young Street is not reliant upon commercial uses, but rather interesting and personal scale activities which reflect the service lane nature of the road. in this regard the façade treatments, bicycle parking areas, public seating, building articulation and modulation and provision of a footpath also serve to create visual interest, which when coupled with the clear residential entry levels will appropriately address the nature and function of the road.

Additionally, the College Road façade presents as a conventional domestic scale with balconies, window ratios and front doors which complement the existing streetscape. Similarly, terraces at the top of the podium level and balconies above create opportunities for social interaction.

In my opinion the relevant provisions of the Development Plan that should apply in the context and functions of both streetscapes, which are achieved by the development, include:

> HIGH STREET POLICY AREA:
> **Objective 2:** Buildings sited to provide a continuous and consistent built edge with verandahs/awnings over the public footpath and an intimate built scale, with fine-grained detailing of buildings in the public realm.
>
> CITY WIDE:
> **PDC 39** Building design should emphasise all pedestrian entry points to provide all users with perceptible and direct access from public street frontages and vehicle parking areas.
> **PDC 40** Buildings, landscaping, paving and signage should have a coordinated appearance that maintains and enhances the visual attractiveness of the locality.

> **PDC 59** Development should be designed to maximise surveillance of public spaces through the incorporation of clear lines of sight, appropriate lighting and the use of visible permeable barriers wherever practicable.
> **PDC 260** Buildings should:
> (a) achieve a human scale at ground level through the use of elements such as canopies, verandahs or building projections;
> (b) provide shelter over the footpath where minimal setbacks are desirable; and
> (c) ensure walls on the boundary that are visible from public land include visually interesting treatments to break up large blank facades.

Turning to the impact of the proposed development on the adjoining land I have previously expressed my opinion that while larger in scale, the visual appearance of the building is appropriately managed as a consequence of various design techniques being employed with respect to the shape, form, textures, colours, materials and space around the buildings.

The Development Plan additionally seeks that privacy be managed as follows:

> CITY WIDE:
> **PDC 234** In areas where buildings of 3 or more storeys are contemplated, direct overlooking into habitable room windows or onto the useable private open spaces of other dwellings from upper level windows, external balconies, terraces and decks should be minimised through the adoption of one or more of the following methods and may be supplemented by landscaping:
> (a) building layout;
> (b) location and design of windows and balconies;
> (c) screening devices; or
> (d) adequate separation.
> **PDC 263** The visual privacy of ground floor dwellings within multi-storey buildings should be protected through the use of design features such as the elevation of ground floors above street level, setbacks from the street and the location of verandahs, windows, porticos or the like.

Having reviewed the planning drawings it is evident that privacy will be maintained in accordance with the Development Plan (noting physical screens, building separation and the nature of adjoining land uses).

Crime Prevention through Environmental Design

I note that various provisions of the Development Plan seek outcomes including clear lines of sight, use of public lighting (in which case I note the reference to lighting within the communal open space areas), active street frontages and balconies to encourage passive street surveillance (previously discussed), identifiable points of entry into the building and the supply of secure and private areas for residents and visitor parking.

Various relevant provisions in this regard include:

> CITY WIDE
> **Objective 22:** A safe, secure and crime resistant environment where land uses are integrated and designed to facilitate community surveillance.
> **PDC 60** Buildings should be designed to overlook public and communal open spaces and streets to allow casual surveillance.
> **PDC 61** Buildings should be designed to minimise and discourage access between roofs, balconies and windows of adjoining dwellings.
> **PDC 62** Development, including car park facilities should incorporate signage and lighting that indicate the entrances and pathways to, from and within the site.
> **PDC 63** Site planning, buildings, fences, landscaping and other features should clearly differentiate between public, communal and private areas.

PDC 64 Development should avoid pedestrian entrapment spots and routes and paths that are predictable or unchangeable and offer no choice to pedestrians.
PDC 65 Development fronting an alleyway, laneway (including a service lane), or other minor or unserviced street should be located and designed to maximise safety and security.
PDC 66 Development fronting a laneway (including a service lane), or other minor or unserviced street should maximise the potential for passive surveillance by ensuring that the building can be seen from nearby buildings and the laneway/minor streets/unserviced streets.
PDC 261 The ground floor level of buildings (including the foyer areas of residential buildings) should be designed to enable surveillance from public land to the inside of the building at night.

In my opinion, the development achieves the above provisions.

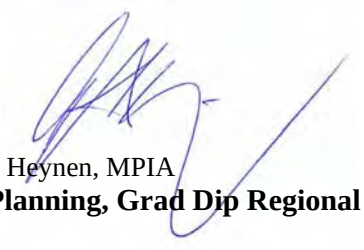
Traffic Access, Safety and Parking

Having reviewed the advice from Cirqa, and considered the Development Plan provisions and circumstances of the locality, I concur with the opinions of Mr Ben Wilson as expressed on 8 February 2017 with respect to the adequacy of car parking, the safe and convenient access to car parking, the design of the parking spaces and the adequacy of the number of car parks, and bikes parks to service the mixed use development.

SUMMARY:

The proposed multi-storey residential development in my opinion displays substantial planning merit. Aspects of the proposal that demonstrate compliance with the Development Plan include:

- the entirely appropriate proposed use;
- the consistency of the density with the Desired Character;
- the appropriateness of the bulk and scale of the buildings;
- the appropriateness of the building heights and the advancement of the key development area "E";
- the provision of street frontages which correspond with the function of Little Young Street and College Road;
- the high quality architectural expression throughout the development;
- the provision of car parking and safe and convenient access;
- the maintenance of privacy for existing and future residents;
- the provision of appropriate set backs from all boundaries;
- the appropriate levels of passive surveillance and social and visual interaction between public and private spaces;
- the suitable provision of quality storage areas for occupant needs;
- the appropriate, varied and flexible dwelling designs and provision of an area for adaptive re-use;
- the access to light and ventilation within each dwelling; and
- the appropriate provision of private and communal open space.



Garth Heynen, MPIA
BA Planning, Grad Dip Regional &Urban Planning, Grad Dip Property

Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	02/11/2015 01:46PM
Customer Reference	
Order ID	20151102006437
Cost	$279.00

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Registrar-General

Certificate of Title - Volume 6130 Folio 16

REAL PROPERTY ACT, 1886
South Australia

Parent Title(s)	CT 5526/586
Dealing(s) Creating Title	DDA 12075267
Title Issued	05/02/2014
Edition	1
Edition Issued	05/02/2014

Estate Type

FEE SIMPLE

Registered Proprietor

FAMUS PTY. LTD. (ACN: 009 326 345)
OF 883 WELLINGTON STREET WEST PERTH WA 6005

Description of Land

ALLOTMENT 25 DEPOSITED PLAN 49351
IN THE AREA NAMED KENT TOWN
HUNDRED OF ADELAIDE

Easements

NIL

Schedule of Dealings

Dealing Number	Description
8499084	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
10471297	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

Notations

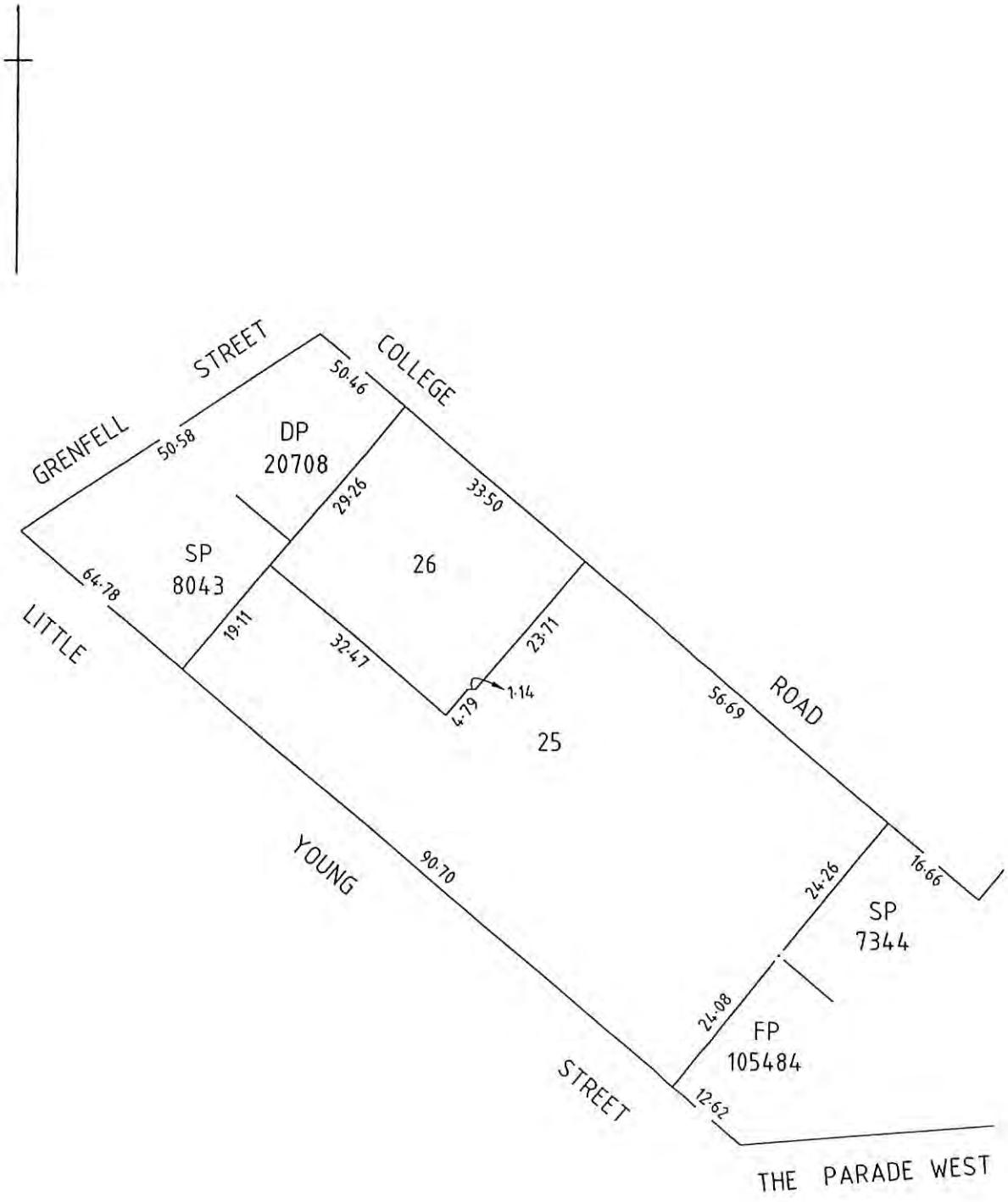
Dealings Affecting Title

NIL

Priority Notices

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Product	Register Search
Date/Time	02/11/2015 01:46PM
Customer Reference	
Order ID	20151102006437
Cost	$279.00



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25 College Road

Minister's Specification SA 78B Assessment

February 2017

sonus.

Chris Turnbull
Principal
Phone: +61 (0) 417 845 720
Email: ct@sonus.com.au
www.sonus.com.au

INTRODUCTION

A noise assessment has been conducted for the proposed residential development located at 25 College Road, Kent Town.

The assessment has been conducted based on the following:

- *Priszinski architects* "Issue 5 - for approval" drawing set titled *25 College Road, Kent Town* and dated 7 February 2017;
- the Minister's Specification SA 78B *Construction requirements for the control of external sound* (SA78B), and the associated South Australian Planning Policy Library Technical Information Sheet 08 *Noise and Air Emissions Overlay 3.*

This report summarises the assessment and provides acoustic treatment options to ensure that all dwellings in the development are designed in accordance with SA78B.

CRITERIA

Development Plan

The development does not front any "designated roads" in the Norwood Payneham and St Peters (City) Council Development Plan (the Development Plan), however the subject site is in a "designated area", through the Air and Noise Emissions Overlay of the Development Plan. As such, the procedures of the *Minister's Specification SA 78B* are mandatory for the assessment noise from a mixed use area.

Ministers Specification SA 78B

SA78B applies to *"all Class 1, 2, 3, 4 or 9c aged care buildings that are in a designated area identified on the Noise and Air Emissions Overlay in the relevant Development Plan"*, and establishes mandatory requirements for the building facade to adequately reduce traffic noise inside the building.

SA78B requires acoustic treatment to dwellings based on the "sound exposure category" that the various facades of the dwelling fall under. The categories range from 1 to 5, with Category 1 requiring limited acoustic treatment and Category 5 requiring extensive treatment.

Depending on the assigned category, the requirements of SA78B can apply to the construction of external walls, doors and windows, roofs and ceilings, and ventilation systems.

ASSESSMENT

In accordance with the SA78B requirements for a mixed use area, the site is assessed as Category 1.

The following acoustic treatments are provided to ensure the development achieves the mandatory Category 1 requirements of SA78B.

External Walls

External walls in Category 1 facades are required to achieve an airborne noise rating ($R_w + C_{tr}$) of 45. This rating can be achieved with a precast concrete wall of minimum thickness 100mm, or the following lightweight construction:

- external cladding consisting of 2 layers of 9.5mm thick compressed fibre cement sheeting;
- minimum 64mm thick steel studs;
- minimum 50mm thick glass or mineral wool insulation installed in the cavity; and
- 1 layer of 13mm thick fire rated plasterboard fixed to the inside face.

Where the façade comprises external glazing which is "blacked-out" internally, the following construction is required to achieve an airborne noise rating ($R_w + C_{tr}$) of 45, therefore allowing the area to be considered as a wall rather than a window:

- 6.38mm thick laminated glass external glazing;
- 90mm wide cavity on the internal side;
- 75mm thick Rockwool insulation with minimum density of 60kg/m^3, or a HD wall batt with thickness of 90mm and R-value of at least 2.5, installed in the cavity; and
- 2 layers of 13mm thick fire-rated plasterboard to the internal side.

It is noted that other external wall construction options can be developed or reviewed if required.

Ventilation

If outside air ventilation, other than openable windows, is provided across a Category 1 facade then that ventilation system must be designed to achieve an R_w rating of 40. Further advice can be provided if such a ventilation system is desired.

Windows and Glazed Doors

The SA78B requirements for windows and glazed doors are dependent on the facade category, the area of glazing as a percentage of floor area, and the proposed use of the room.

The following acoustic treatments have been based on window and floor area ratios calculated from the *Priszinski architects* drawing set dated 7 February 2016. Where there is external glazing that is internally "blacked-out" it is understood that the construction described in the *External Walls* section on Page 4 will be implemented. Based on this construction, the subject areas may be considered as external walls rather than windows. To maintain the acoustic integrity of these walls it should be ensured that an airtight seal is achieved between the wall cavity and the habitable room.

Bedrooms highlighted in BLUE in Appendix A:

- Construct windows from 10mm thick glass in a fixed or awning arrangement fitted with acoustic seals.
- Construct glazed side-hung doors from 10mm thick glass in a system with acoustic seals.
- Construct glazed sliding doors such that they have an airborne noise rating ($R_w + C_{tr}$) of 34. This can be achieved with various proprietary sliding doors, such as the AWS "Thermally Broken Sliding Door", or tandem sliding doors.

All Other Bedrooms

- Construct windows from minimum 6mm thick glass in a fixed or awning arrangement fitted with acoustic seals, or 10mm thick glass in a sliding arrangement fitted with acoustic seals
- Construct glazed side-hung doors from 6mm thick glass in a system with acoustic seals.
- Construct glazed sliding doors from 10mm thick glass in a system with acoustic seals.

Living Rooms

- Construct windows from minimum 6mm thick glass in any arrangement provided it is fitted with acoustic seals.
- Construct glazed doors from 6mm thick glass in any arrangement provided it is fitted with acoustic seals.

APPENDIX A: Rooms that require upgraded glazing constructions

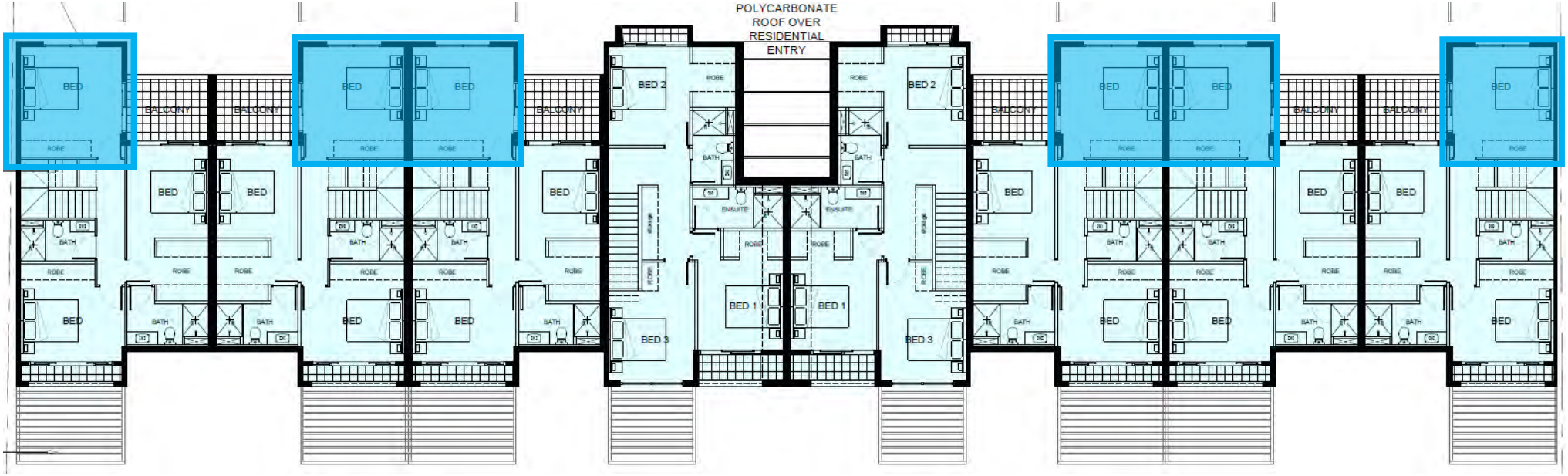


Figure 1: Townhouse bedrooms that require additional treatment to glazing (level 1)

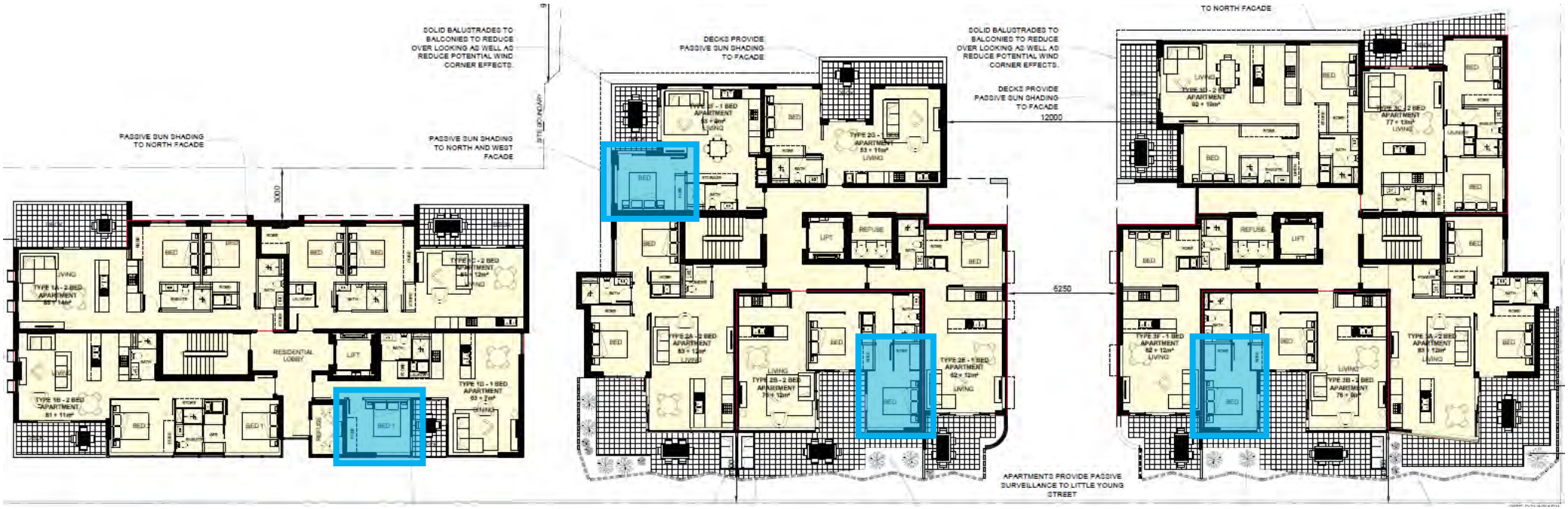


Figure 2: Level 1 and 2 bedrooms that require additional treatment to glazing

Ref: 16085|BNW

Mr David Cargill
Scope Development Solutions
Level 5, 100 Pirie Street
ADELAIDE SA 5000

1 May 2017

Dear David,

PROPOSED RESIDENTIAL DEVELOPMENT
25 COLLEGE ROAD, KENT TOWN

I refer to the proposed residential development at 25 College Road, Kent Town. As requested, I have undertaken an assessment of traffic and parking aspects of the proposal. This report provides a summary of the development and associated assessments undertaken.

1 EXISTING SITUATION

The subject site is located on the north-eastern side of Little Young Street, Kent Town. The site is bounded by College Road to the northeast, commercial premises to the southeast, Little Young Street to the southwest and commercial premises to the west. The site is situated within an Urban Corridor Zone (High Street Policy Area 14.3) as identified within the City of Norwood, Payneham and St Peters' Development Plan.

The site currently contains a large 2,551 gross floor area commercial building (previously occupied by the Bureau of Meteorology) and associated parking areas. A total of 28 parking spaces were provided for the former use. Vehicle access to the site is provided via a two-way crossover on Little Young Street, at which all turning movements are provided. Pedestrian access is provided via both College Road and Little Young Street.

Deliveries and refuse collection associated with the previous use of the existing site were undertaken on College Road (within a dedicated loading zone) and via an off-street loading bay accessed from Little Young Street.

1.1 Adjacent Transport Networks

The Parade West is a sub-arterial road under the care and control of the City of Norwood, Payneham and St Peters (NPSP). Adjacent the subject site, The Parade West contains a single traffic lane in each direction, with adjacent bicycle and parallel parking lanes on either side. On-street parking on the northern side of The Parade West is restricted to one hour Monday to Friday (between 9:00 am and 5:00 pm) and Saturday (9:00 am to 12:00 pm). Paved footpaths are provided on both sides of the roadway. This section of The Parade West is subject to a default urban speed limit of 50 km/h. Traffic data provided by the Department of Planning, Transport and Infrastructure (DPTI) identifies an Annual Average Daily Traffic (AADT) volumes of 7,700 vehicles per day (vpd), of which approximately 2.3% are commercial vehicles.

College Road is a local street comprising a single traffic lane in each direction, with unrestricted parallel on-street parking on both sides. Paved footpaths are provided on both sides of the road, servicing both pedestrians and cyclists. Bicycle movements are also accommodated on street under a standard shared arrangement. College Road is under the care and control of the City of Norwood, Payneham and St Peters, and is subject to a 50 km/h speed limit. DPTI traffic data indicates that College Road has an AADT in the order of 1,600 vpd, of which approximately 1.7% are commercial vehicles.

Little Young Street is a local street (providing access to adjoining businesses and parking areas) under the care and control of the City of Norwood, Payneham and St Peters. Two-way traffic movements are facilitated on the street's 6 m wide (approximate) carriageway. On-street parking is permitted on its southwestern side. Due to the nature of Little Young Street, pedestrian and bicycle movements are accommodated on the roadway. This is considered acceptable due to the street's low traffic volume and low speed environment (and is typical of laneways within the surrounding area).

The site is well serviced by active transport (walking and cycling facilities) with footpaths and on road bicycle lanes provided on numerous arterial roads within close vicinity to the site, providing connections to/from the Adelaide CBD and broader 'BikeDirect' network.

Public transport routes (buses) also operate within close vicinity to the subject site. Key roads such as The Parade West, Flinders Street and the nearby Dequetteville Terrace facilitate routes which link the site to the CBD and metropolitan Adelaide. There is also the potential for the future extension of a tram route along The Parade West (subject to planning, design and funding). The tram route (if it proceeds) would be expected to connect The Parade retail and entertainment strip and the Adelaide CBD, and would provide a valuable transport service for the subject site.

2 THE PROPOSAL

The proposed development comprises the demolition of the existing building and construction of the following:

- 8 townhouses fronting College Road; and

- 3 apartment buildings with 13 one-bedroom and 57 two-bedroom residential units.

Each townhouse will include a covered (garaged) parking space. Six of the townhouses will also have a stacked (tandem) visitor space. Driveways for the townhouse garages and visitor spaces will be provided directly via College Road. The provision of driveways will result in the removal of the existing loading zone (which was primarily associated with the site's former use) and two on-street parking spaces. At least five on-street spaces will be retained along the site's College Road frontage.

The apartment dwellings will be serviced by a ground floor covered car park with two-way access provided via Little Young Street. The car park will provide 85 parking spaces (resulting in an overall provision of 99 spaces including the townhouse parking). The car park spaces will be designated for residents (72 spaces) and visitors (13 spaces including 4 spaces for use by persons with disabilities). One parking space on Little Young Street (opposite the access) will require removal to accommodate the two-way movements. However, should the Prince Alfred College boarding house development proceed, this loss could be offset by additional spaces possible from the removal of redundant crossovers.

The access for the car park will comprise an overall width of 7.5 m (plus clearances either side) and include a central island for the provision of a card reader and intercom. Visitors utilising the car park (rather than on-street spaces) will be able to access it via the intercom. Regular visitors (such as cleaners) may also be provided with a 'swipe card' for access. Pedestrian sight lines will be provided at the access.

The parking areas will conform with the Australian / New Zealand Standard for Parking Facilities – Part 1: Off-Street Car Parking (AS/NZS 2890.1:2004) and Part 2: Off-Street Parking for People with Disabilities (AS/NZS 2890.6:2009), in that:

- parking spaces will be at least 2.4 m wide and 5.4 m long;
- aisles will be a minimum of 5.8 m wide (plus at least 300 mm clearance to obstructions);
- 1.0 m end of aisle extensions will be provided on blind aisles;
- a 2.4 m wide shared area will be provided adjacent the parking spaces for use by persons with disabilities; and
- adequate clearances to obstructions will be provided and the car clearance envelope requirements will be met for the proposed parking spaces;

The site will include a number of pedestrian access points including a central (common) pedestrian connection between College Road and Little Young Street, dedicated doors for direct access to the covered car park and individual pedestrian access points for the townhouses on College Road. The development's Little Young Street has also been

setback to effectively increase the width of Little Young Street and improve accommodation of pedestrian movements along its frontage.

Secure bicycle parking (for will be provided within the covered car park as well as additional visitor parking on the first level (at-grade with College Road). A total of 54 bicycle parking spaces are proposed. Additional bicycles can also be accommodated within storages areas in the car park as well within individual dwellings.

Refuse collection will occur within the covered car park. The access point and internal layout has been designed to accommodate movements into, within and out of the site by a 6.5 m refuse truck (with 300 mm clearance to obstructions). The refuse vehicle will enter the site and store within the parking aisle during waste collection at each bin store. The vehicle will then utilise the first internal aisle intersection to turnaround within the site and exit in a forward direction. The headheight within the parking area will have a minimum clearance of 3.3 m which will suit the proposed vehicle. Confirmation of the headheight requirements has been provided by a major waste collection contractor for the proposed vehicle size (refer attached emails). Figure 1 illustrates the subject movement.

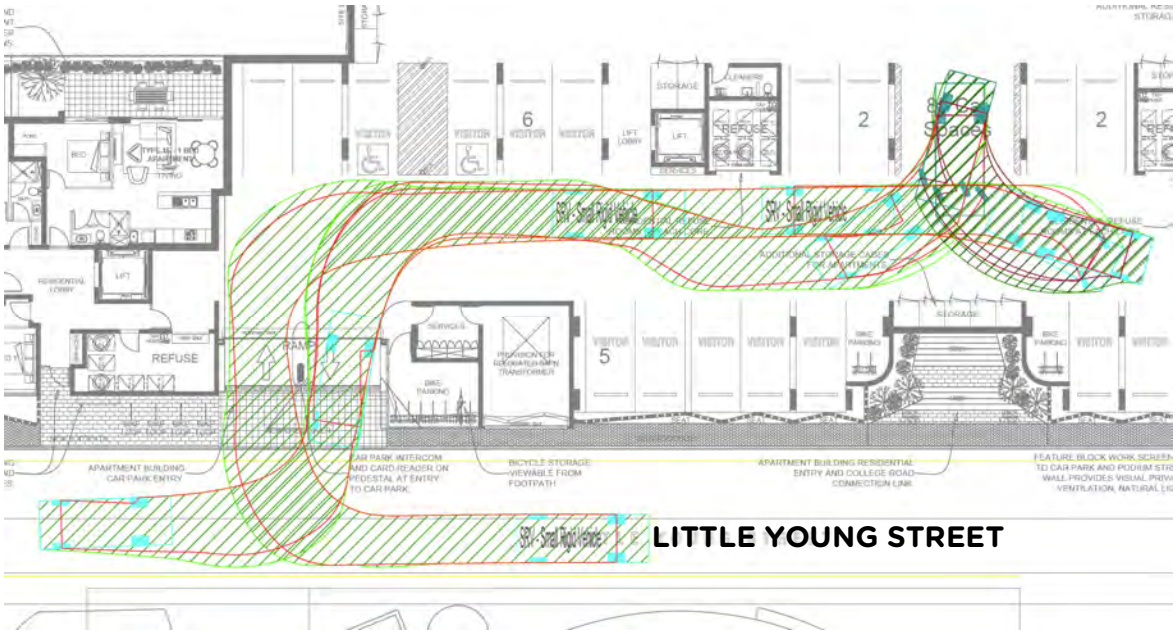


Figure 1 – Small refuse collection truck access movement and turnaround

3 PARKING ASSESSMENT

3.1 Vehicle Parking

The City of Norwood, Payneham and St Peters' Development Plan identifies the following parking provision rates relevant to the proposal:

- non-residential development – a desired minimum of 3 spaces per 100 m² with a maximum of 6 spaces per 100 m²;

- apartments – one space per studio, one-bedroom or two-bedroom dwelling plus 0.25 visitor spaces per dwelling; and

- townhouses – two spaces per three-bedroom dwelling (no separate visitor requirement).

Based on the above rates, there is an existing requirement associated with the current commercial approval on the site of 77 parking spaces. Only 28 spaces are currently provided and there is therefore an existing shortfall of 49 spaces associated with the existing commercial use.

For the proposed development, the Development Plan rates identify a requirement for 86 resident and 18 visitor parking spaces. On the basis that the development accommodates the full resident parking requirement, there is therefore a shortfall of 5 visitor parking spaces associated with the proposal. Such a shortfall represents a significant improvement on the shortfall associated with the site's existing use.

In addition, while demand for on street parking within the vicinity of the site is relatively high during business hours, peak visitor demands would typically occur during weekday evening and weekends. At these times there is a higher level of parking availability on the adjacent network and the small parking shortfall associated with the proposal would be easily accommodated within walking distance of the site.

3.2 Bicycle Parking

Council's Development Plan identifies the following requirements for bicycle parking relevant to the proposal:

- multi-storey building/residential flat building: one resident bicycle space per two dwellings and one visitor bicycle space per five dwellings.

No requirement is identified for row dwellings (or similar) which would apply to the townhouses (essentially it assumed bicycle parking is accommodated within the dwellings).

There is therefore a requirement for 35 resident bicycle spaces and 14 visitor bicycle spaces. The proposed provision of a total of 54 bicycle spaces will exceed the above requirement.

4 TRAFFIC ASSESSMENT

4.1 Traffic Generation

The NSW RMS "Guide to Traffic Generating Developments" (and its subsequent updates) is often utilised by traffic consultants to forecast (vehicular) traffic volumes generated by proposed developments. In relation to the subject development, the most RMS guide and its updates identify the following generation rates:

- 0.50 to 0.65 trips per dwelling in both the am and pm peak hours for medium density dwellings (applied to the townhouses);

- 0.53 and 0.32 trips per dwelling in the am and pm peak hours, respectively, for apartment residential development (within a regional location).

It should be noted that the RMS guide provides lower rates for residential development within Sydney, however to provide a conservative assessment the regional rates have been adopted for this assessment. In reality, the generation associated with the site is anticipated to be lower than that experienced in regional NSW areas given the proximity of the subject site to the Adelaide CBD and its high level of public transport and active transport facilities/services.

On the basis of the above, it is forecast that the proposed development will generate in the order of 43 am and 28 pm peak hours trips. This does not include consideration of the generation associated with the former site use. The additional number of trips (compared to the previous use) would therefore be much lower than suggested by the above forecasts. Nevertheless, for conservatism the full forecast volumes have been adopted for the following assessment.

4.2 Traffic Distribution

Using available demographic information (2011 Census data) for the associated statistical area, a distribution assessment for AM and PM peak hour movements based on the location of (existing Kent Town) residents' places of employment has been prepared (additional allowance for other trip purposes, such as those associated with students has been included). Similarly, to allow a level of conservatism in the distribution, the proportion of residents assumed to traffic to/from the CBD has been increased compared to that identified from the Census data.

The distribution assessment has therefore been based on the following assumptions:

- the am peak hour movements are split 20% in to / 80% out of the site;

- the pm peak hour movements are split 70% in to / 30% out of the site;

- 10% of trips will be distributed to/from the north;

- 25% of trips will be distributed to/from the east;

- 15% of trips will be distributed to/from the south; and

- 50% of trips will be distributed to/from west.

The assessment provides further conservatism, in that it assumes all residents travelling to/from the north and west of the site (approximately 60%) exit the site, turn left onto Grenfell Street and right onto The Parade West in the AM (and vice versa in the PM). Similarly, all movements to/from the south and east have been conservatively

assumed to be distributed to the intersection of Little Young Street and Parade West. In reality, there are alternative routes through the adjacent road network (such as via Grenfell Street/Fullarton Road) which a proportion of drivers would be likely to take.

Table 1 summarises the am and pm peak hour movements forecast as a result of the above generation and distribution assumptions (including the intersection the additional movements have been assigned to for the impact assessment).

Table 1 - Forecast am and pm peak hour movements

	AM Peak Hour		PM Peak Hour		
	IN	OUT	IN	OUT	via
to/from the North	1	3	2	1	Parade West / Grenfell
to/from the East	2	9	5	2	Parade West / Little Young
to/from the South	1	5	3	1	Parade West / Little Young
to from the West	4	17	10	4	Parade West / Grenfell

4.3 Traffic Impact

The primary impact of the additional movements would be experienced at the intersections of Little Young Street and Grenfell Street with The Parade West (where higher volumes on The Parade West warrant assessment). While volumes will also be distributed to the intersections of College Road and Little Young Street with Grenfell Street, these intersections have low traffic volumes and minimal queues and delays during the peak hours (and other times).

On the basis of the above forecasts, SIDRA intersection modelling analysis has been prepared to identify the potential impact of the additional traffic movements. The SIDRA analysis has been prepared utilising existing traffic data provided by DPTI as well as data recorded at the key intersections during the morning and afternoon/evening commuter periods on Monday 8 August 2016. The assessment also considers the potential additional traffic generation associated with the Prince Alfred College boarding house development (based on data provided in the traffic report prepared for its associated application).

The attached output sheets provide the detailed SIDRA output results for the intersections of The Parade West / Little Young Street and The Parade West/Grenfell Street. The analysis indicates that the traffic generated by the proposal will be readily accommodated at the intersections and on the adjacent road network. Of note, the SIDRA analysis forecasts that average delays at the two intersections will increase by less than one second (during both the am and pm peak hours) and that there will be no change to existing Levels of Service ratings for each movement at the two intersections. There will also be negligible change in 95th percentile queues experienced for the non-priority movements at these intersections.

5 SUMMARY

The proposal will result in the demolition of the existing commercial use on the site and construction of 78 new residential dwellings. Access to the site will primarily be

provided via Little Young Street, however the eight townhouses proposed will have access directly via College Road.

The site has a high level of accessibility by public transport and is well connected to the surrounding active transport (walking and cycling) networks. The site's proximity to the CBD and The Parade will encourage a relatively high modal share for both walking and cycling. This will minimise reliance on private motor vehicle use for residents and likely result in a lower traffic generation than conservatively forecast.

A total of 99 car parking spaces and 54 bicycle parking spaces will be provided within the site. The proposed car park has been designed in accordance with the relevant Australian Standards.

An assessment of the proposal against the parking requirements of Council's Development Plan identifies minor shortfalls in the provision of car (5 spaces). The car parking shortfall will be associated with visitor parking (typically short-term) which can easily be accommodated on-street in the vicinity of the site. Furthermore, the proposal will result in a significant reduction in the existing shortfall associated with the site (an improvement of 44 spaces).

The bicycle parking provisions (for both residents and visitors) will exceed the requirements of Council's Development Plan.

The proposal will generate a relatively low level of additional movements on to the adjacent road network. The peak generation period of the development will occur during the am peak period with in the order of 45 vehicle movements generated by the site (determined on a conservative basis). Observation and SIDRA analyses indicate that the additional movements will be easily accommodated on the adjacent road network.

Please feel free to contact me on 0412 835 711 should you require any additional information.

Yours Sincerely,



BEN WILSON
Director, CIRQA Pty Ltd

Encs. - SIDRA output sheets

- Emails between Ben Wilson (CIRQA) and David Parr (Veolia)

Ben Wilson (CIRQA)

Subject: FW: Rear Lift Truck - Head height

From: David Parr [mailto:david.parr@veolia.com]
Sent: Wednesday, 23 November 2016 12:55 PM
To: Ben Wilson (CIRQA) <ben@cirqa.com.au>
Cc: Thomas Wilson <thomas@cirqa.com.au>
Subject: Re: Rear Lift Truck - Head height

Yes looks like should be ok but would certainly ensure that when the service is instigated that the height restriction is identified to the service provider early.

Regards
David Parr
Sent from my iPhone

On 23 Nov. 2016, at 12:25 pm, Ben Wilson (CIRQA) <ben@cirqa.com.au> wrote:

> Hi David,
>
> Thanks for getting back to me on this… the Architects have managed to get 3300 mm headroom in the tightest spot (3.6 m elsewhere and where refuse collection would occur).
>
> Is 3300 mm sufficient for your lowest unit?
>
> Thanks,
>
> **Ben Wilson**
> **Director, CIRQA Pty Ltd**
>
> **Mobile:** 0412 835 711
> **Email:** ben@cirqa.com.au
> **Web:** cirqa.com.au
> **Postal:** PO BOX 144, Glenside SA 5065
> **ABN:** 12 681 029 983

<image004.png>

Planning and Design of Networks to Move People

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From: Parr, David [mailto:david.parr@veolia.com]
Sent: Thursday, 17 November 2016 7:31 PM
To: Ben Wilson (CIRQA) <ben@cirqa.com.au>
Subject: Re: FW: Rear Lift Truck - Head height

Ben,
Our lowest Gen waste RL unit is a fraction under 3mtrs.
What height have you got to play with ?

David Parr | Projects Delivery & Solutions Partner, Department of Defence, Central West Region (SA/NT/WA) **| Veolia Australia and New Zealand**

A: 500 Churchill Rd | Kilburn | SA | 5084

P: 08 82033656 | M: 0418 824 027 | E: david.parr@veolia.com

Resourcing the world VEOLIA

On 17 November 2016 at 12:10, Ben Wilson (CIRQA) <ben@cirqa.com.au> wrote:

> Hi David,
>
> We are working on an apartment development in Kent Town that will have fairly restricted head height where refuse collection vehicles are needed. Are you able to advise the headheight required for Veolia's small refuse collection vehicles (approx. 6.5m long or similar from memory).
>
> Thank you,

Ben Wilson
Director, CIRQA Pty Ltd

Mobile: 0412 835 711
Email: ben@cirqa.com.au
Web: cirqa.com.au
Postal: PO BOX 144, Glenside SA 5065
ABN: 12 681 029 983



Planning and Design of Networks to Move People

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STORMWATER MANAGEMENT REPORT

College Road (25), Kent Town

Prepared by:

PT Design ABN 35 008 116 916
141-149 Ifould Street, ADELAIDE SA 5000
Tel: (08) 8412 4300 Fax: (08) 8232 4311

Project No: 18811
Revision: -00-
Date of Issue: 13/12/2016

INTRODUCTION

25 CKT Pty. Ltd. propose to construct a new multi storey apartment development. The site is an axe shaped parcel of land that fronts both College Road and Little Young Street in Kent Town. The site currently consists of a large carpark area and large commercial building. This report is to support the planning submission and outlines the manner in which stormwater will be managed from the site.

THE SITE

The site is an axe shaped parcel of land approx. 3355m^2 in area that falls approx. 5.0m from the south-east corner of the site to the north-west corner. The existing site is predominantly covered with impervious surfaces (roof and pavement) other than a small section of sloped landscaped area. There are no flows from adjoining sites flowing onto this particular site as all flows should be maintained within the road reserve of the bordering streets.

There doesn't appear to be any stormwater infrastructure in either of the adjacent streets. All the existing stormwater discharges at surface onto the road pavement and flows down the street.

STORMWATER DETENTION

The City of Norwood, Payneham & St. Peters Development Plan states that stormwater should be managed to reduce the flow and ensure the carrying capacities of downstream systems are not overloaded. Whilst it does not state any specific detention requirement, given the site's pre-development conditions and the nature of the proposed development (i.e. the numerous landscaped, pervious areas), the total stormwater flow from the site will be similar. Calculations show that just 1.2kL of detention storage for the entire site would be required (refer to appendix A). Given the nature of the development and the fact that we are capturing stormwater for re-use in the development this office believes that detention of stormwater is therefore not necessary.

STORMWATER RETENTION

There are 21 apartments/townhouses that have their own roof catchment. All the roof from these catchments will be directed to 2 x 21 kL underground rainwater tanks beneath the carpark (42 kL storage in total). This equates to 2.0 kL of storage per apartment with a roof over which satisfy's council's requirements.

The water harvested will be re-used within the development. Whether that be by plumbing back into the toilets or used for irrigation purposes is yet to be determined. The final make up of the storage tanks and how they are reticulated back through the building will be further refined as we get into detailed design stage. This will be done in consultation with council's Engineers.

STORMWATER DESIGN

There have been numerous finished floor levels set for the proposed development (refer to the accompanying drawing for the specific FFLs). Each of these have been set a min 300mm above the nearest adjacent water table level to provide freeboard protection during a major storm event. We reserve the right to adjust some of the FFLs slightly to assist with access into the building. This will be looked at in more detail when we get into the detail design stage. The 300mm above the nearest adjacent water table level will always be maintained.

Water Sensitive Urban Design measures have been added in the form of rainwater harvesting.

All carpark areas are under cover. Therefore no treatment of the stormwater prior to discharging from the site is required.

Stormwater pipe sizes will be sized in accordance with AS 3500.3. This will be done during the detail design stage.

APPENDIX A

STORMWATER DETENTION CALCULATIONS

STORMWATER CALCULATIONS

College Road (25), Kent Town

Prepared by:

PT Design ABN 35 008 116 916
141-149 Ifould Street, ADELAIDE SA 5000
Tel: (08) 8412 4300 Fax: (08) 8232 4311

Project No: 18811
Revision: -00-
Date of Issue: 10/02/2017

Project:	College Road	Project #	18811
	Kent Town	Date	10.2.2017
Design By:	MP	Page	1

PRE DEVELOPMENT v POST DEVELOPMENT DETENTION VOLUME

PUMPED SYSTEM

Time of Concentration	5	mins
Rainfall Intensity	94.2	mm/hr

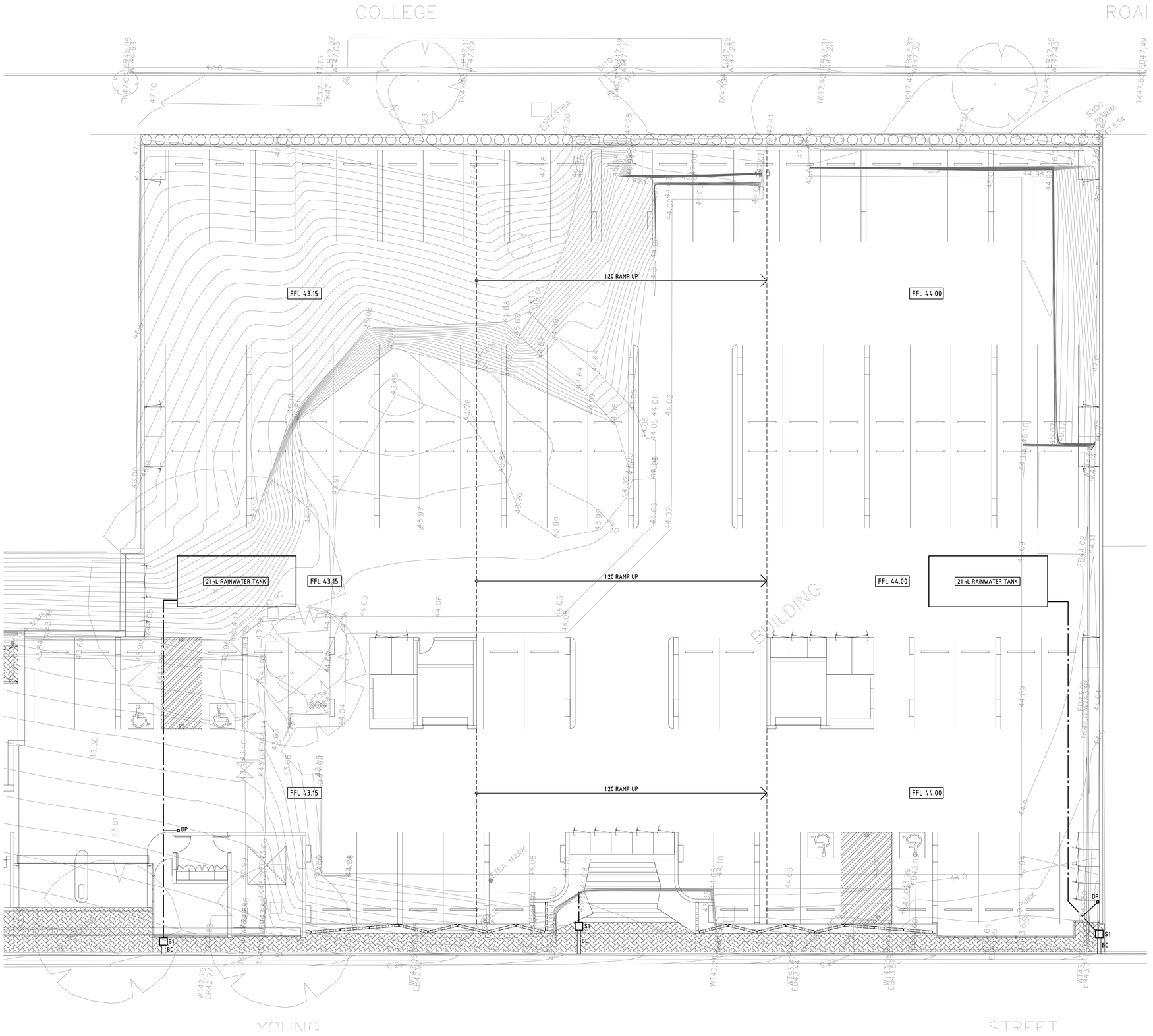
PRE DEVELOPMENT FLOW

Catchment Area	C	Area (m^2)		
Roof	0.9	1150.2	27.1	
Impervious	0.75	1679	33.0	
Pervious	0.2	645.1	3.4	
		Total	**63.4**	L/sec

POST DEVELOPMENT FLOW

Catchment Area	C	Area (m^2)		
Roof	0.9	1909.2	44.96	
Impervious	0.75	1746.7	34.28	
Pervious	0.2	421.5	2.21	
		Total	**81.4**	L/sec

TIME PUMP INITIATED	3.9	mins
STORAGE VOLUME REQUIRED	1198	L^3



0 2500 5000 10000

SCALE 1:100 @B1

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LEGEND

- STORMWATER PIPE TO FUTURE DETAILS
- S1 BOUNDARY SUMP TO FUTURE DETAILS
- DP DOWNPIPE
- GIP GRATED INLET POINT
- BC GALV. BOX CHANNEL TO FUTURE DETAILS
- GRADE LINE
- PAVING TO FUTURE DETAILS

NOTE:

DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AS A PACKAGE. REFER TO ARCHITECTS DRAWINGS FOR ALL SETOUT DIMENSIONS.

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Project

PROPOSED DEVELOPMENT
25 COLLEGE ROAD
KENT TOWN

Client

SCOPE DEVELOPMENT SOLUTIONS

N

Drawing Title

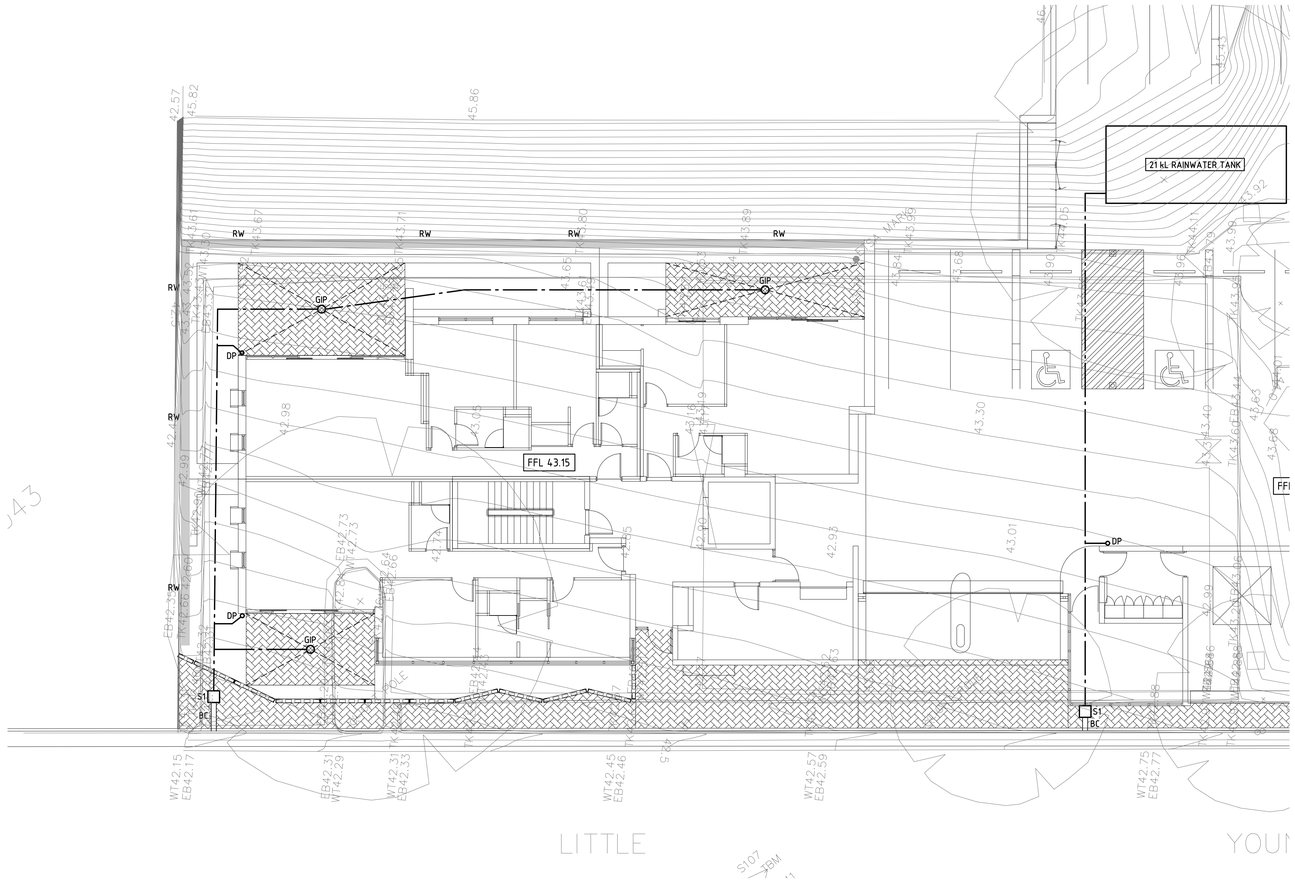
BASEMENT LEVEL DRAINAGE LAYOUT

Scale: 1:100

Drawing Number: **18811-C01**

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LEGEND

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KENT TOWN

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BASEMENT LEVEL DRAINAGE LAYOUT

Scale

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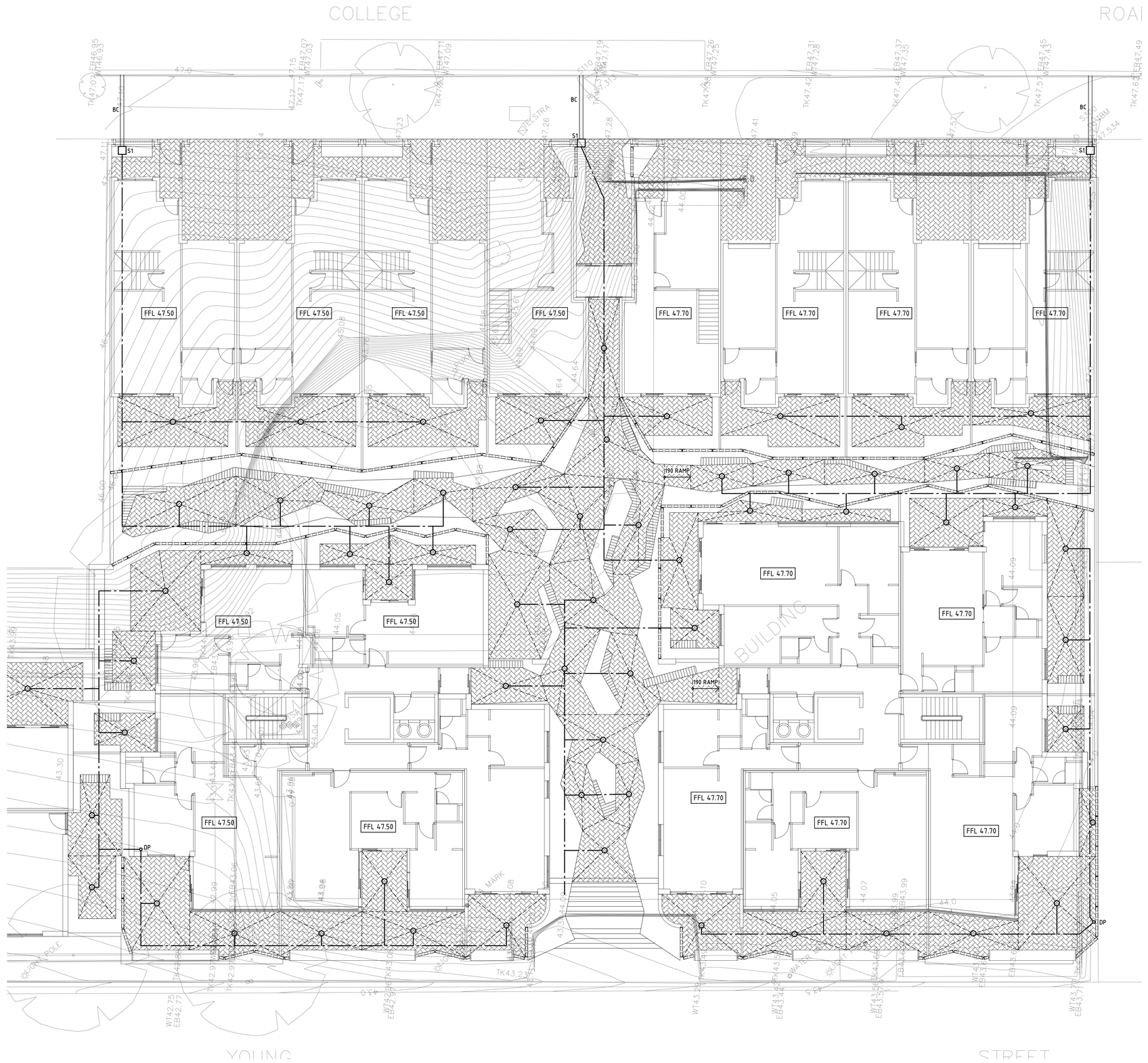
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Drawing Title

GROUND LEVEL DRAINAGE LAYOUT

Scale

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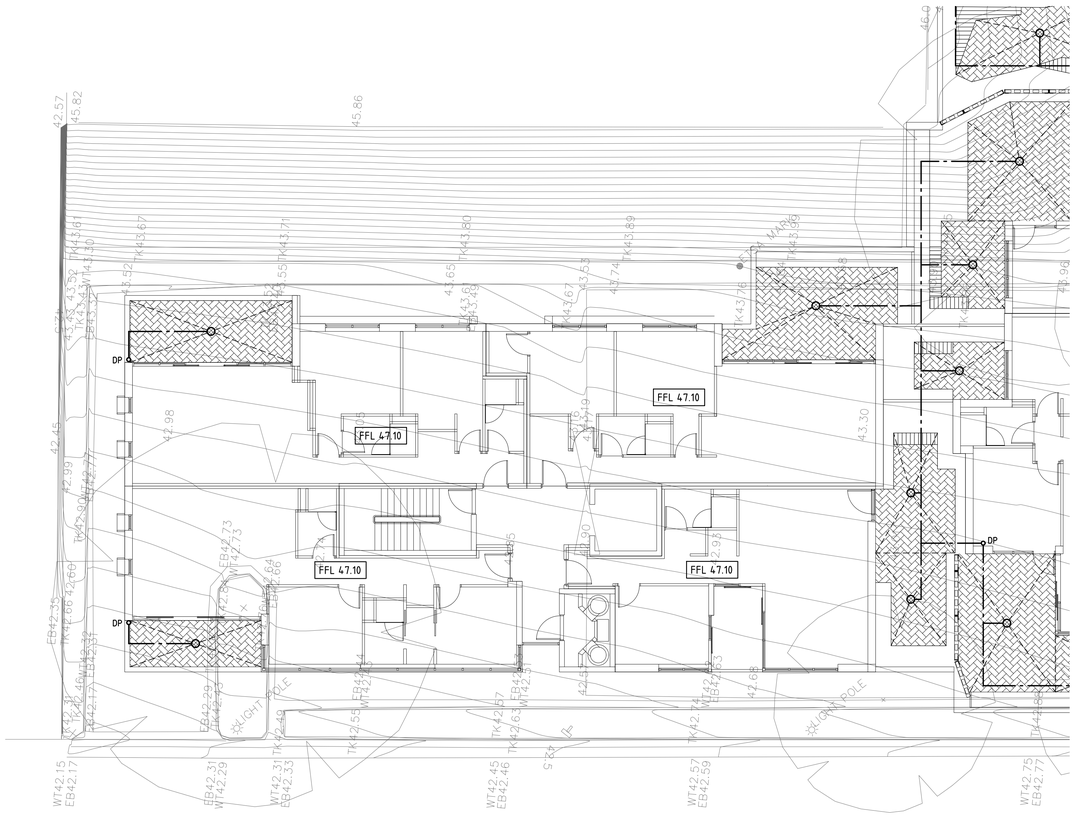
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KENT TOWN

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GROUND LEVEL DRAINAGE LAYOUT

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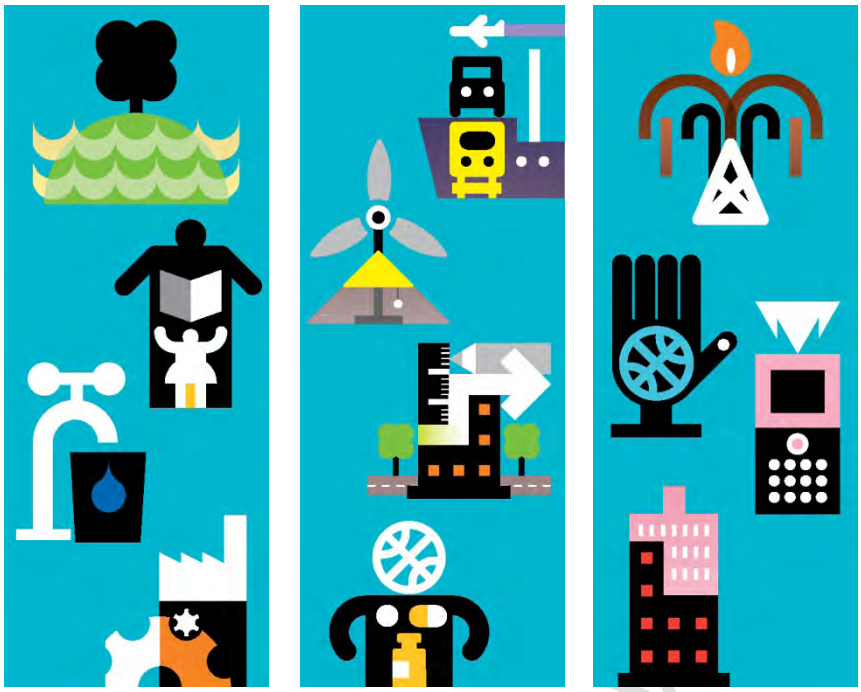
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Preliminary Environmental Site History Assessment

Draft for client review

25 College Road, Kent Town, South Australia

29 April 2016

The Trustee for Scope Development Trust

Preliminary Environmental Site History Assessment

25 College Road, Kent Town, South Australia

29 April 2016

The Trustee for Scope Development Trust

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Mott MacDonald

Issue and revision record

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B	29 April 2016	RL/CK	AM	AM	Draft for client review (proposal details added)

Secure

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Contents

Chapter Title		Page
1	Introduction	1
1.1	Background	1
1.2	Proposed Development	2
1.3	Aim	2
1.4	Scope of work	2
2	Regulatory and assessment framework	4
2.1	Site contamination	4
2.2	Norwood Payneham and St Peters (City) Development Plan(Consolidated – 2 July 2015)	4
2.3	Environment Protection Act, 1993	5
2.4	Assessment guidelines	6
3	Site description	7
3.1	Site walkover and photographs	7
3.2	Aesthetic considerations	10
3.3	Surrounding land use	10
3.4	Regional geology and hydrogeology	11
3.5	History of ownership	11
3.6	Almanacs and directories research	14
3.7	Aerial photographs	15
3.8	Dangerous goods search	15
3.9	EPA Section 7 search	15
3.10	SA EPA Public Register Directory	15
3.11	Asbestos register	16
3.12	Acid sulphate soils	16
3.13	Areas of environmental interest	16
4	Conclusion	17
4.1	Findings	17
4.2	Preliminary risk appraisal	17
4.3	Commercial context	18
4.4	Recommendations	18
5	Limitations	19

Appendices 21

Appendix A.	Certificate of title	22
Appendix B.	DEWNR groundwater data	23
Appendix C.	Historical aerial photographs	24
Appendix D.	Dangerous goods licence search results	25
Appendix E.	Section 7 search results	26
Appendix F.	State Library of South Australia almanac and directory search results	27

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Appendix G. Asbestos register_____ 28

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1 Introduction

1.1 Background

Mott MacDonald Australia Pty Ltd (Mott MacDonald) was commissioned by The Trustee for Scope Development Trust to conduct environmental site history research for the land defined as 25 College Road, Kent Town, South Australia (CT 6130/16). A copy of the applicable Certificate of Title is provided in Appendix A.

The site is situated in the City of Norwood Payneham and St Peters local government area. The site context is provided in Figure 1.1, and an aerial photograph showing the site is provided in Figure 1.2.

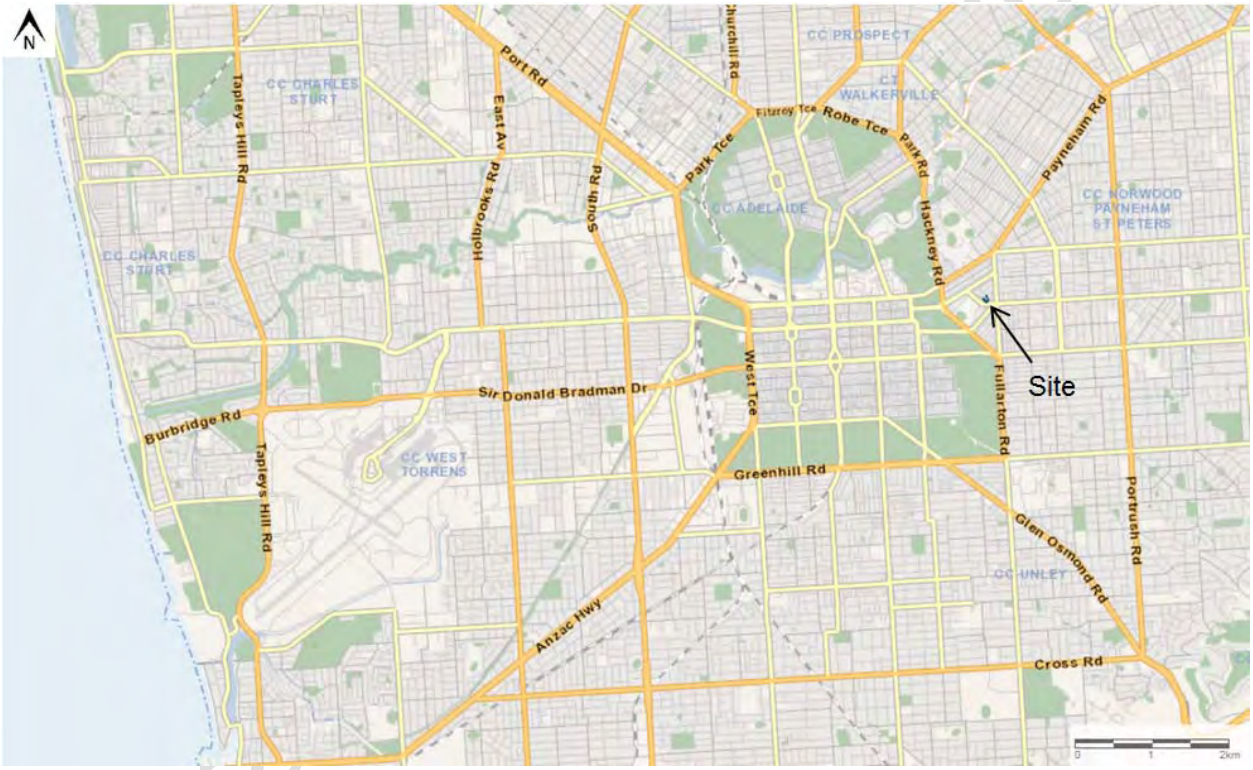


Figure 1.1: Map showing site location and context (source: http://maps.sa.gov.au/plb/, 2016)

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Figure 1.2: Aerial photograph showing the approximate site boundary (source: http://maps.sa.gov.au/plb/, 2016)

1.2 Proposed Development

We understand the nature of the proposed development to be elevated multi-storey residential apartments. The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark. Groundwater is not proposed for abstraction at the site and there would be little opportunity for access to subsurface soils once developed. The site would not be used for primary food production.

1.3 Aim

The aim was to assess the potential for gross or widespread soil contamination to exist as a result of current or previous land uses at the site and whether there are issues likely to present potential liabilities or constraints on future development.

1.4 Scope of work

The site history assessment included consideration of information from the following sources:

- Site walkover
- Safework SA Dangerous Goods Licence Search [results are pending]
- Environment Protection Authority (EPA) Section 7 Search
- Department of Planning, Transport and Infrastructure (DPTI) Property Assist Certificate of Title search

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- Department of Environment, Water and Natural Resources (DEWNR) Mapland historical aerial photograph search
- Department of Environment, Water and Natural Resources Groundwater Database search
- Historical certificate of title search via the Department of Planning, Transport and Infrastructure South Australian Integrated Land Information System (SALIS)
- State Library of South Australia almanacs and directories research
- Appendix A of the SA EPA Guidelines Site Contamination – Acid Sulfate Soil Materials (November 2007)

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2 Regulatory and assessment framework

2.1 Site contamination

Soil contamination has the potential to impact adversely on human health and the environment; however in order for a significant or identifiable risk to be present, there must be an exposure pathway. The exposure pathway comprises the following:

- Source – The presence of a substance that may cause harm.
- Receptor – The presence of a receptor which might be harmed at an exposure point.
- Pathway – The existence of a means or mechanism of exposing a receptor to the source.

In the absence of a plausible exposure pathway there can be minimal risk. Therefore, the presence of 'something measureable' i.e. concentrations of a chemical or presence of asbestos does not necessarily imply that there is measurable human harm. It is necessary to have a significant source of contamination, an appropriate or effective pathway for this to be presented to a receptor, and the receptor must have a negative response to this exposure.

Hence, the nature and importance of sources, receptors and exposure routes will vary with every site, situation, intended end use and environmental setting.

It should also be noted that management measures to address any aspect of the above can reduce the significance of any risks.

2.2 Norwood Payneham and St Peters (City) Development Plan(Consolidated – 2 July 2015)

The Norwood Payneham and St Peters (City) Development Plan (Consolidated – 2 July 2015) contains the following provisions in relation to contaminated sites:

Objectives:

Objective 52: Appropriate assessment and remediation of site contamination to ensure land is suitable from the proposed use and provides a safe and healthy living and working environment.

Objective 53: Protection of human health and the environment wherever site contamination has been identified or suspected to have occurred.

Site Contamination:

172 Development, including land division, should not take place where site contamination has occurred unless the site has been assessed and remediated as necessary to ensure that it is suitable and safe for the proposed use.

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2.3 Environment Protection Act, 1993

In South Australia, the assessment, management and remediation of site contamination is regulated by the *Environment Protection Act 1993* (EP Act). The EP Act defines site contamination in section 5B as follows:

> *(1) For the purposes of this Act, site contamination exists at a site if—*
>
> > *(a) chemical substances are present on or below the surface of the site in concentrations above the background concentrations (if any); and*
> >
> > *(b) the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere; and*
> >
> > *(c) the presence of the chemical substances in those concentrations has resulted in—*
> >
> > > *(i) actual or potential harm to the health or safety of human beings that is not trivial, taking into account current or proposed land uses; or*
> > >
> > > *(ii) actual or potential harm to water that is not trivial; or*
> > >
> > > *(iii) other actual or potential environmental harm that is not trivial, taking into account current or proposed land uses.*
>
> *(2) For the purposes of this Act, environmental harm is caused by the presence of chemical substances—*
>
> > *(a) whether the harm is a direct or indirect result of the presence of the chemical substances; and*
> >
> > *(b) whether the harm results from the presence of the chemical substances alone or the combined effects of the presence of the chemical substances and other factors.*
>
> *(3) For the purposes of this Act, site contamination does not exist at a site if circumstances of a kind prescribed by regulation apply to the site.*

Based on the above, the first stage in determining whether or not site contamination exists is to assess whether chemical substances have been added to the site through an activity and whether these substances are above background concentrations. The second stage is to assess whether the chemical substances have resulted in actual or potential harm to the health or safety of human beings or the environment that is not trivial.

The professional assessment of site contamination and consequential risk to human health and the environment is guided by the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM), Australian Standards and several guidelines prepared the EPA. The NEPM operates as an environment protection policy under the EP Act.

If site contamination is determined to be present at a site, the EP Act provides mechanisms to assign responsibility for the contamination and appropriate assessment and/or remediation of the contamination.

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2.4 Assessment guidelines

The scope of works and methodology adopted for the site history research were generally based on the guidance provided in the following documents:

- ANZECC/NHMR.C (1992). Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites.
- NEPC (1999), National Environment Protection (Assessment of Site Contamination) Measure, December 1999 (ASC NEPM) as amended in 2013
- Edwards J.W., Van Alphen M. and Langley A. (1994). Identification and Assessment of Contaminated Land: Improving Site History Appraisal. Contaminated Sites Monograph Series No 3, SA Health Commission, Adelaide.
- Standards Australia. Guide to the investigation and sampling of sites with potentially contaminated soil – AS 4482.1-2005.

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3 Site description

3.1 Site walkover and photographs

A site visit was conducted on 27 April 2016 by a Mott MacDonald representative. The site is approximately 3,370m^2 in plan area. Access to the site building is from street level off College Road. However, the ground level of the site is approximately 2.5m below street/ground level. It would appear that the site has been cut away in the past and retaining walls front College Road and the site to the south.

The site is occupied by a large multi-storey building across approximately two thirds of the site. A bitumen carpark is located in the north-western portion of the site. A loading bay is located in the southern portion and a garden is located in the northern portion.

Site walkover photographs are shown in Photos 3.1-3.10.

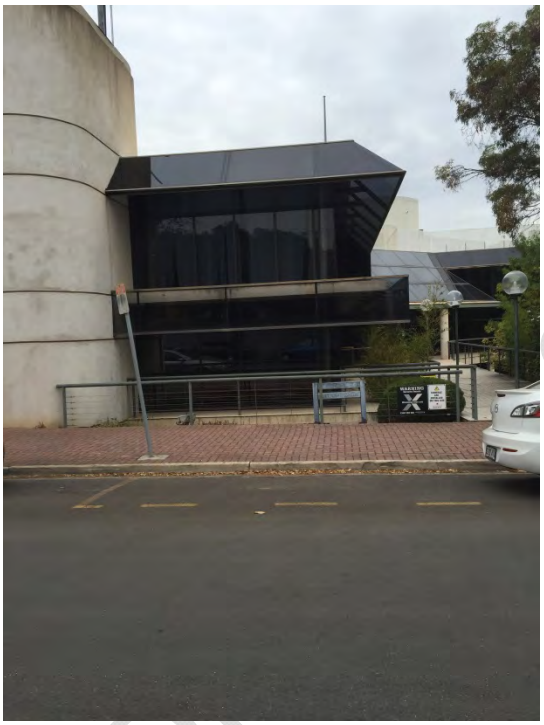


Photo 3.1: Photograph of outside of site taken from College Road looking west



Photo 3.2: Photograph of rear of site showing southern portion of site

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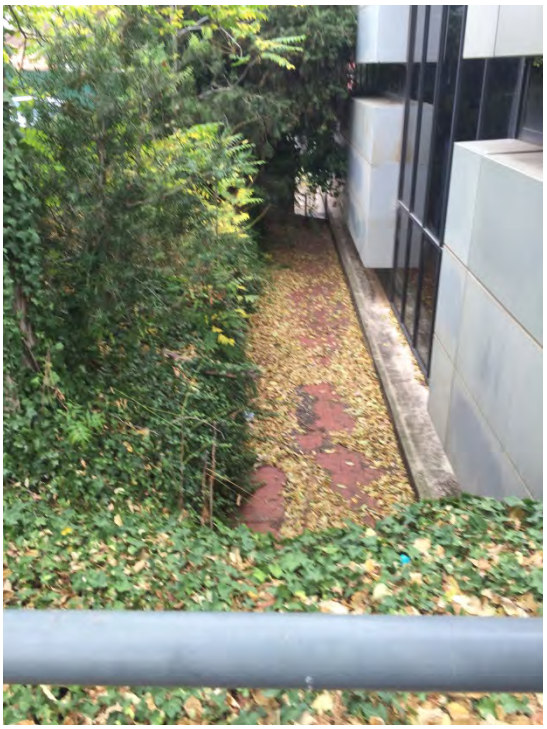


Photo 3.3: Photograph of southern boundary of site



Photo 3.4: Photograph of southern face of site building



Photo 3.5: Photograph of central ground level site courtyard

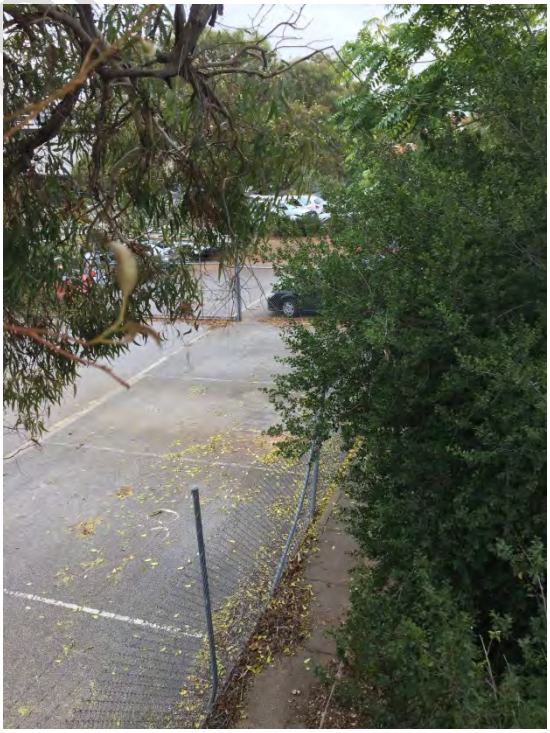


Photo 3.6: Photograph of site carpark facing west

Client



Photo 3.7: Photograph of inside of site building



Photo 3.8: Photograph of inside of site building



Photo 3.9: Photograph of inside of site building



Photo 3.10: Photograph of inside of site building

3.2 Aesthetic considerations

Aesthetic considerations relate to the presence of low-concern or non-hazardous inert foreign material (refuse) in soil or fill resulting from human activity. Construction and demolition waste materials, some of which are inert and non-hazardous and are widely distributed in urban areas, soils with discolouration from relatively inert chemical waste (for example ferric metals) or residual odour (for example, natural sulphur odour) are included in this category.

There are no specific numeric aesthetic guidelines; however site assessment requires balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. The following observations were made in relation to aesthetic issues at the site:

- There were no significant odours (e.g. strong residual petroleum hydrocarbon odours)
- There was no hydrocarbon sheen on the site surface
- There were no discoloured chemical deposits or stains with chemical waste.
- There were no observations of large monolithic deposits of otherwise low-risk material, e.g. gypsum as powder or plasterboard/cement kiln dust
- There was no putrescible refuse, including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste

3.3 Surrounding land use

The site is located on the southern side of College Road, and is set approximately 100m back from the Fullarton Road and The Parade intersection in the south-eastern corner of the suburb of Kent Town. The site is currently occupied by the Australia Bureau of Meteorology (BOM). The surrounding area contains a mixture of residential properties (generally to the north-east) and commercial properties (to the west and south). Specifically:

- A commercial property (financial services) and associated car park is located directly to the south-east of the site.
- Chloe's Restaurant and Function Centre are located directly opposite the site at 36 College Road.
- Opposite the site along College Road to the north-west are residential houses and unit blocks (medium to high density housing).
- The rear of the site fronts onto Little Young Street. Little Young Street is lined with commercial properties and associated car parking, beyond which are the Prince Alfred College grounds.
- A metal working/blacksmith operation is located on the south-western boundary of the site.

The surrounding area is generally level.

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3.4 Regional geology and hydrogeology

A summary of the regional geology and hydrogeology is presented in Table 3.1.

Table 3.1: Regional geology and hydrogeology

Source	Detail
Soil	
South Australia 1: 250 000 Scanned Geological Maps Published and Unpublished. Department for Manufacturing, Innovation, Trade, Resources and Energy. Version 2008:2.	Pooraka Formation. Pale red-brown sandy clay containing carbonate of the LOVEDAY SOIL. Gravel lenses near ranges. Small outcrops of older calcrete and veneers of younger sand and soil are not differentiated.
Hydrogeology	
Department of Environment, Water and Natural Resources Groundwater Database (refer to Appendix B)	The DEWNR groundwater database indicates that there are 26 groundwater wells within a 0.5km radius of the site. The recorded standing water levels in the area surrounding the site vary between 3.6-9.25mbgl. The maximum recorded depth of the wells ranges from 6.2-94.4mbgl. Total dissolved solid concentrations are recorded as being between 350mg/L and 1,885mg/L. The wells are listed as being for the following purposes: ▪ Investigation (11) ▪ TWS (2) ▪ Monitoring (1) ▪ Observation (1) ▪ Domestic (1) No groundwater wells are recorded as occurring at the site. The groundwater data report and plan showing the location of groundwater wells surrounding the site are provided in Appendix B.

The closest major surface waterbody to the site is the River Torrens, located approximately 1.5km north-west of the site. Three ponds in the city parklands are located approximately 875m west of the site. The Gulf St Vincent is located approximately 11.5km west of the site.

3.5 History of ownership

A history of ownership search was conducted through the DPTI South Australian Integrated Land Information System (SALIS) website[1] for CT 6130/16. The search results are summarised in Table 3.2.

Table 3.2: Ownership summary

Title reference	Date	Name	Details
CT6130/16	5/2/2014	Famus Pty Ltd	West Perth
CT5526/586	21/4/1998	Famus Pty Ltd	West Perth
	1/10/2007	7 year lease to Commonwealth of Australia	-
CT5078/934	10/7/1992	The Commonwealth of Australia	Adelaide
CT3543/121	6/2/1968	**Rigby Ltd**	James Place, Adelaide
	20/2/1974	Transfer to Commonwealth of Australia	-
CT1185/144	5/1/1921	William Sanders, Pianoforte Dealer	Adelaide
	24/5/1944	Transfer to Brenda Margaret Bishop, Married woman	Beulah Park
	13/1/1954	Transfer to Otto Emil Benz and Leslie Albert Benz, **Motor Wreckers**	Torrensville
	30/1/1957	Transfer to William Roy Fox, Contractor	Evandale

[1] https://www.sailis.sa.gov.au/home/public

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Title reference	Date	Name	Details
	22/4/1959	Transfer to Ivy May Fox, Home Duties	Kensington
	26/8/1960	Transfer to Phoebe Gladys Martin Rushton Smith, Married Woman	Kent Town
	26/8/1960	Transfer to United Dominions Corporation Australia Ltd	-
	17/7/1967	Transfer to **Rigby Ltd**	James Place, Adelaide
CT2195/138	18/3/1952	Murray Harrison Richardson, Earthmover and Desmond Haig Richardson, Engineer	Richmond, Vic, and Hawthorne
	11/3/1952	Transfer to Claude Hubert Pearce, **Carpenter**	Kent Town
	25/10/1957	Transfer to **Rigby Ltd**	James Place, Adelaide
CT1201/150	8/6/1921	Harriett Alareda Harris, Wife of Charles Davenport Harris, Civil Servant	Hyde Park
	16/5/1934	Transfer to Joseph Bower Rowley, Out of Business	Hyde Park
	1/12/1938	Transfer to Harrison Richardson, Out of Business	Parkside
	28/11/1951	Transfer to Murray Harrison Richardson, **Earth Moving Equipment Operator** and Desmond Haig Richardson, University Student	Richmond, Vic, and Mount Gambier(?)
CT231/131	2/8/1876	Edward William Kitchin, Gentleman	Kent Town
	26/4/1882	Transfer to David Davies, Gentleman	Kent Town
	22/5/1891	Harriett Alareda Harris, Wife of Charles Davenport Harris, Civil Servant; Sidney Eastwood Davies, Merchants Clerk; and James Richard Percival, Storekeeper – Executors of The Will of David Davies	Hyde Park, Broken Hill and [illegible]
	12/11/1894	Transfer to Henry Scott and Walter Gooch, Accountant	Adelaide
	12/8/1907	Transfer to Walter Gooch; Walter Charles Scott, Merchant; and Harry Bentham Field, Bank Manager	Adelaide and Port Adelaide
	31/7/1918	Transfer to Walter Gooch, Merchant; Walter Charles Scott, Out of Business; and Alfred Horsley Chapman, Company Manager	Adelaide and Grange
CT2391/133	3/6/1955	John Henry Swan and Charles Alexander Swan, Real Estate Agents	Glenelg
	24/5/1955	Transfer to Fred Warhurst, **Master Printer**	Currie St, Adelaide
	9/5/1963	Transfer to Phoebe Gladys Martin Rushton Smith, Hospital Proprietress	Kent Town
	17/7/1967	**Rigby Ltd**	James Place, Adelaide
CT281/215	3/7/1878	James Crabb Verco, Gentleman	North Adelaide
	15/12/1885	Transfer to Jane Burges, wife of John Burges, Modeller	Kent Town
	24/10/1889	Transmittal of Mortgage to Tomas Benjamin Verco, Agent	Adelaide
	7/6/1910	Transfer to Richard William Swan, Licenced Land Broker	Adelaide
	10/2/1943	Transmission to John Henry Swan and Charles Alexander Swan, Real Estate Agents	Kingswood and Glenelg
CT3333/168	9/7/1965	Vassiolios Carapanayotis, Labourer and Marigo Carapanayotis, his Wife	Kent Town
	16/11/1966	Transfer to Town and Country Investments Pty Ltd 1/3rd, and Thomas Kalliontzis, Fruit Merchant 2/3rd	Adelaide and Croydon
CT1185/145	5/1/1921	Mary McDonough and Katie McDonough, Spinsters	Kent Town
	16/9/1921	Transfer to Ellen Middleton, Widow	Stirling West
	1/2/1927 [illegible]	Transfer to David Johnston, Caretaker of an estate in fee simple	Norwood
	29/11/1949	Transfer to Elsie May Johnston, Wife	Kent Town
	19/12/1951	Transfer to Elsie May Johnston, Widow and Dorothy Mary	Kent Town

Title reference	Date	Name	Details
		Willshire, Married Woman	
	12/2/1952	Elsie May Johnston married Percy James Schook [illegible], Driver	Hindmarsh
	20/2/1952	Transfer to Dorothy Mary Willshire	
	13/4/1953	Transfer to Torello Cecchezini, Labourer and his Wife, and Amedeo Marzari, Labourer	Kent Town
	29/7/1953	Transfer to Ferdinando Coppola, Labourer and his Wife	Lockleys
	18/8/1953	Transfer to Guiseppe Largi, Labourer	Kent Town
	[Illegible]	Transfer to Vassilios Carapanatyotios, Labourer and his Wife	Kent Town
CT60/65	15/12/1864	John Stagg, Carter [illegible]	Kent Town
	28/3/1882	Transfer to David Davies, Gentleman	Kent Town
	19/1/1887	Transfer to Thomas Edward Acraman, Estate Agent	Adelaide
	30/10/1889	Transfer to George Philip Doolette, Outfitter	Adelaide
	8/3/1892	Transfer to Harriett Alareda Harris, Wife of Charles David Harris Civil Servant; Lucy Goodland, Wife of Harry Philimore Goodland, Civil Servant; and Alice Mary Sims, Widow	Hyde Park, Adelaide and Kew, Vic
	17/6/1914	Transfer to James Thomas Brown, Contractor	Adelaide
	3/7/1920	Transfer to Joseph Christopher Gapp, [illegible]	Adelaide
	19/10/1920	Transfer to Mary Mcdonough and Katie Mcdonough, Spinsters	Kent Town
	12/11/1920	Transfer to William Sauders (no occupation stated)	
CT3508/92	17/8/1967	**Rigby Ltd**	James Place, Adelaide
CT2228/130	26/9/1952	Phoebe Gladys Martin Rushton Smith, Married Woman	Kent Town
	17/7/1967	Transfer to Rigby Ltd	James Place, Adelaide
CT1201/129	4/6/1921	Harriett Alareda Harris, Wife of Charles David Harris Civil Servant; Lucy Goodland, Wife of Harry Philimore Goodland, Civil Servant; and Alice Mary Sims, Widow	Hyde Park, Adelaide and Kew, Vic
	9/4/1921	Transfer to Eugenie Gertrude Harris, Spinster	Kent Town
	31/3/1926	Eugenie Edward Harris married Reginald George Bonython, **Farmer**	Korrika
	5/9/1934	Transmission to Hilary Goodland, Saleswoman	Gardenvale, Vic
	23/10/1934	Transfer to George Smith, **Grazier**	Prospect
	11/12/1942	Transfer to Robert Girling, Out of Business	Dubbo, NSW
	9/3/1945	Transfer to Phoebe Gladys Martin Rushton Smith, Married Woman	Maryborough, Qld
CT1925/54	29/1/1947	Phoebe Gladys Martin Rushton Smith, Married Woman	Maryborough, Qld
	17/7/1967	Transfer to Rigby Ltd	James Place, Adelaide
CT238/128	3/11/1876	Thomas David Pearson, Commission Merchant	Adelaide
	28/4/1879	Transfer to David Davies, Draper	Adelaide
	19/1/1887	Transfer to Thomas Edward Acraman, Estate Agent	Adelaide
	30/10/1889	Transfer to George Philip Doolette, Outfitter	Adelaide
	8/3/1892	Transfer to Harriett Alareda Harris, Wife of Charles David Harris Civil Servant; Lucy Goodland, Wife of Harry Philimore Goodland, Civil Servant; and Alice Mary Sims, Widow	Hyde Park, Adelaide and Kew, Vic
	9/4/1921	Transfer of 1/3rd to Eugenie Gertrude Harris	
	26/10/1927	Eugenie Gertrude Harris married Reginald George	Korrika

Title reference	Date	Name	Details
		Bonython, **Farmer**	
	2/8/1930	Transmission 1/3rd to Hilary Goodland, Saleswoman	Gardenvale, Vic
	23/10/1934	Transfer to George Smith, **Grazier**	Prospect
	11/12/1942	Transfer to Robert Girling, Out of Business	Dubbo, NSW
	9/3/1945	Transfer to Phoebe Gladys Martin Rushton Smith, Married Woman	Maryborough, Qld

Source: Lands Title Office, Department of Planning, Transport and Infrastructure, Government of South Australia

A Google search suggests that Rigby Ltd was a large South Australian publishing house.

3.6 Almanacs and directories research

A search of publically available almanacs and directories via the State Library of South Australia was conducted for the site[2].

The first South Australian directory was published by Robert Thomas of the *South Australian Register* newspaper in 1839. The last directory was published by the Melbourne-based stationers, Sands and McDougall in 1973. The directories included mercantile, ecclesiastical, legal, and other occupational and trade listings. This eventually developed into a 'trades and professions' section. In 1873, Josiah Boothby introduced a street by street listing for the city at the front of the directory. He compiled a list of businesses and private dwellings by location, which continued being published in all subsequent directories until 1973 by Sands and McDougall.

It is noted that street numbers in the city have been changed on occasion, in particular in the mid-1880s when the pattern of odd and even numbering was standardised, and again in 1920 to incorporate the subdivisions of city acres which had taken place since settlement. This therefore makes site identification impossible in some instances and/or misleading. It is also noted that inclusion of business details within the almanacs was not mandatory and therefore the absence of a site address is these directories does not necessarily mean that a business was not present at the site.

The site was searched for in the directories for each year from 1864 to 1973 inclusively. No notable records that apply with reasonable confidence to the site are noted. The applicable extracts are presented in Appendix F.

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[2] Available at: http://guides.slsa.sa.gov.au/

3.7 Aerial photographs

Selected aerial photographs of the area were assessed at approximately 10 year intervals from 1949. The aerial photograph data and observations are presented in Table 3.3 and copies of the photographs are provided in Appendix C.

Table 3.3: Historical aerial photograph review

Year	Notes
1949	The aerial photograph is presented in black and white and is of poor resolution. The site appears to contain two large buildings. The surrounding area is relatively densely built upon. It is not possible to determine the nature of the buildings due to the image quality.
1959	The aerial photograph is presented in black and white and is of poor resolution. The site appears to contain vegetation and some structures, although their nature cannot be determined. The surrounding area appears to be relatively densely built upon. It is not possible to determine the nature of the buildings due to the image quality.
1968	The aerial photograph is presented in black and white and is of low resolution. The site now appears to be cleared with no vegetation or building structures evident. The surrounding area appears to be densely built upon, with a number of large industrial/warehouse looking structures. It is not possible to determine the nature of the buildings due to the image quality.
1979	The aerial photograph is presented in colour and is a very poor resolution. The site appears to contain a single large building structure. The surrounding area appears to be similar to the previous aerial photograph.
1989	The aerial photograph is presented in colour and is of good resolution. The site appears to contain a single large structure on the south-eastern portion, with a car parking area on the north-west and large trees on the north-eastern portion. The surrounding area appears to be similar to the previous aerial photograph.
1999	The aerial photograph is presented in colour. The site appears similar to the previous aerial photograph. The surrounding area appears to be similar to the previous aerial photograph.
2005	The aerial photograph is presented in colour and is of good resolution. The site appears similar to the previous aerial photograph. The surrounding area appears to be similar to the previous aerial photograph.

3.8 Dangerous goods search

[Information pending]

3.9 EPA Section 7 search

A Section 7 search was made under the *Land and Business (Sales and Conveyancing) Act 1994*. The information indicates that no current environmental Performance Agreements, Environment Protection Orders or Clean-up Orders are registered on the site. No known wastes are listed or have been produced on the site. A copy of the Section 7 information is included in Appendix E.

3.10 SA EPA Public Register Directory

The SA EPA Public Register Directory – Site contamination index was searched. This index lists notifications and reports received by the EPA since 1 July 2009 under the *Environment Protection Act 1993*, including S83A notification, Audit notification, Audit termination and Audit reports. No listings in Kent Town or adjacent Norwood were located at or within approximately 350m of the site. The nearest listing was at an approximately 400m distance from the site at 41 Fisher Street and related to fill or soil importation.

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3.11 Asbestos register

An asbestos register has been prepared for the site by Carters Asbestos Management (dated 12 December 2012) and is provided in Appendix G.

3.12 Acid sulphate soils

There was no evidence of the field indicators used to identify acid sulphate soils as listed in Appendix A of the SA EPA Guidelines Site Contamination – Acid Sulphate Soil Materials (2007).

3.13 Areas of environmental interest

Based on this environmental site history research, the chemicals presented in Table 3.4 are indicative of the potential historical and current land uses of CT 6130/16.

The chemicals listed in Table 3.4 are based on AS 4482.1-2005 Appendix J 'Chemical Contaminants Listed by Industry Type', Planning Advisory Notice 20 (PAN 20) Appendix 1 'Examples of potentially contaminating activities and industries' and the Environment Protection Regulations 2009 (EP Regs).

Table 3.4: Summary of potential areas and chemicals of interest

Activity of interest	Chemicals of environmental interest	Medium of interest	Potential significance
Potential fill of unknown origin	Broad analyte screen	Shallow soil	Low
Potential termite treatment	Pesticides, heavy metals	Shallow soil	Low
Motor Wreckers, Earth Moving Equipment Operator	BTEX, PAH, heavy metals, TRH	Soil	Low
Carpenter	Heavy metals from paints, solvents	Soil	Low
Publishing house/Printer	Heavy metals including chromium, solvents, BTEX, PAH, TRH	Soil & groundwater	Medium
Asbestos containing material	Asbestos	Shallow soil	Low if appropriately managed by a qualified asbestos contractor

These chemicals of environmental interest are not a prescriptive list for any further exploratory intrusive assessment that may be conducted, nor a statement of the presence of these chemicals, but rather a list to be given consideration. Analytes to be tested for if further assessment is conducted should be selected based on site specific observations and conditions. In addition, screening level testing may be conducted for analytes which are considered to represent the generally accepted basic suite of chemicals which may then give rise to the need for more detailed or varied analysis.

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4 Conclusion

4.1 Findings

The history of the site has included land uses which have the potential for contaminating activities which may have resulted in the potential for soil and/or groundwater contamination to be present at the site.

The information provided indicates that the site was formerly potentially occupied by other businesses, including a publishing house prior to the construction of the current BOM building.

The aerial photographs available within the allotted report timeframe are of poor quality for the years of 1949 and 1959, therefore it is difficult to discern site features from these images. (Note that higher resolution images are able to be sourced for future reference if required).

The key land use of interest is the occupation by a former publishing and printing house (Rigby Limited). The potential for contamination to have occurred is considered to increase in likelihood further back in time, as waste management practices may have been less developed.

Also of interest are the site levels with respect to the surrounding land and the appearance that the site has been cut down approximately 2.5m fronting College Road and the adjacent property on the southern boundary. Access to the site via Little Young Street is consistent with surrounding ground level, indicating that the site has been potentially cut away. If there have been site works which removed a large proportion of residual soils prior to construction of the BOM building, there is some chance that some residual contamination (if present) from previous land use may well have been removed, however this cannot be verified at this stage.

4.2 Preliminary risk appraisal

We understand the nature of the proposed development to be elevated multi-storey residential apartments. The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark. Groundwater is not proposed for abstraction at the site and there would be little opportunity for access to subsurface soils once developed. The site would not be used for primary food production.

This type of development is considered to present a lower risk in terms of the nature of the proposed land use and limited exposure to groundwater and subsurface soils. In addition, the open nature of the ground floor car parking would further reduce the potential impact (if at all present) of any unknown subsurface soil vapour.

Therefore, considering the nature of the previous site works that may have removed a large portion of soils form the site (and therefore potentially a proportion of contaminated soil if present) and the proposed open ground level carpark, it is considered reasonable to assume that the actual likelihood of the site being precluded from the proposed use is low.

In the absence of confirmation of impacts (or otherwise), there is uncertainty regarding the potential future liabilities associated with the soil and groundwater at the site.

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4.3 Commercial context

If contamination is present in the soil and/or groundwater, there may be on-going liabilities associated with the site which may impact (cost and time) on potential future development works. On this basis, the ability to ascertain potential land values and marketing potential is limited without additional understanding as to whether there are potential environmental liabilities associated with the previous land use.

Financial institutions may require further information in relation to potential environmental liabilities. In addition, Council and the SA EPA may also require assurance that the site is suitable for future development in the form a Site Contamination Audit Report from a third party Environmental Auditor (site Contamination). However, this may not be a mandatory requirement given the risk appraisal above. If liabilities are present, they need not necessarily prevent future development (subject to the nature of the contamination) and any potential remedial or monitoring works can be factored into future site development planning.

A greater degree of information in terms of soil and groundwater conditions enables greater certainty to be applied to future land transactions.

4.4 Recommendations

In order to confirm the environmental conditions at the site and the preliminary risk appraisal, we recommend that an intrusive soil and groundwater (if required based on soil assessment results) assessment be conducted.

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5 Limitations

Mott MacDonald Australia Pty Ltd (Mott MacDonald) has prepared this report based on generally accepted practices and standards in operation at the time that it was prepared. No other warranty is made as to the professional advice included in this report. All parties should satisfy themselves that the scope of work conducted and reported herein meets their specific needs before relying on this document.

Mott MacDonald believes that its opinions have been developed according to the professional standard of care for the environmental consulting profession at the date of this document. That standard of care may change as new methods and practices of exploration, testing, analysis and remediation develop in the future, which may produce different results.

Environmental conditions are created by natural processes and human activity, and as such may change over time e.g. groundwater levels may rise or fall, contamination may migrate and fill may be added to the site. This report therefore presents a point in time assessment of the site, and as such can only be valid for the time at which the investigation was undertaken.

Any investigation such as that contained in this report can examine only a fraction of the subsurface conditions at the site. There remains a risk that pockets of contamination or other hazards may not be identified as investigations are necessarily based on sampling at localised points. Certain indicators or evidence of hazardous substances or conditions may have been outside the portion of the subsurface investigated or monitored, and thus may not have been identified or their full significance appreciated. As such, the identified environmental conditions reported are only valid at the points of direct sampling and any derived or interpolated conditions may differ from these targeted locations and cannot be assumed to be indicative of the remainder of the site.

The methodology adopted and the sources of information used are outlined in this report. Mott MacDonald has limited its investigation to the scope agreed for this contract and it is possible that additional sampling and analysis could produce different results and/or opinions. Mott MacDonald has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions.

This assessment assumes that the proposed development meets requirements as outlined in the Building Code of Australia and Australian Standards. If these recommendations are not met, there is potential for the exposure and therefore risk to building users to be higher than that presented in this assessment.

The soil descriptions contained in this report have not been prepared for engineering design purposes and the reinstatement of any sampling locations were not conducted in accordance with any supervised filling or geotechnical standard. The term suitable has been used in the context of a request from the planning authority and means that the concentrations reported did not exceed the guideline concentrations adopted for the proposed land use/exposure pathway.

This report does not include the assessment or consideration of hazardous building materials, including asbestos. Such materials should be assessed and managed by a qualified and licensed assessor/contractor.

In general, the available scientific information pertaining to contamination is insufficient to provide a thorough understanding of all of the potential toxic properties of chemicals to which humans may be exposed. The majority of the toxicological knowledge of chemicals comes from experiments with laboratory

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animals, where there may be interspecies differences in chemical absorption, metabolism, excretion and toxic response. There may also be uncertainties concerning the relevance of animal studies using exposure routes that differ from human exposure routes. In addition, the frequent necessity to extrapolate results of short-term or subchronic animal studies to humans exposed over a lifetime has inherent uncertainty. Therefore, in order to conduct an environmental assessment, it is necessary to take into account these inherent uncertainties and extrapolate information from the data that is available, considered current and endorsed as acceptable for the assessment of risks to human health. There is therefore inherent uncertainty in the process, and to compensate for uncertainty, conservative assumptions are often made that result in an overestimation rather than an underestimation of risk.

All advice, opinions or recommendations contained in this document should be read and relied upon only in the context of the document as a whole. This report does not purport to give legal advice as this can only be given by qualified legal practitioners. This document does not represent a Site Contamination Audit Report.

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Appendices

Appendix A. Certificate of title 22
Appendix B. DEWNR groundwater data 23
Appendix C. Historical aerial photographs 24
Appendix D. Dangerous goods licence search results 25
Appendix E. Section 7 search results 26
Appendix F. State Library of South Australia almanac and directory search results 27
Appendix G. Asbestos register 28

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Appendix A. Certificate of title

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Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	02/11/2015 01:46PM
Customer Reference	
Order ID	20151102006437
Cost	$279.00

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Registrar-General

Certificate of Title - Volume 6130 Folio 16

REAL PROPERTY ACT, 1886
South Australia

Parent Title(s)	CT 5526/586
Dealing(s) Creating Title	DDA 12075267
Title Issued	05/02/2014
Edition	1
Edition Issued	05/02/2014

Estate Type

FEE SIMPLE

Registered Proprietor

FAMUS PTY. LTD. (ACN: 009 326 345)
OF 883 WELLINGTON STREET WEST PERTH WA 6005

Description of Land

ALLOTMENT 25 DEPOSITED PLAN 49351
IN THE AREA NAMED KENT TOWN
HUNDRED OF ADELAIDE

Easements

NIL

Schedule of Dealings

Dealing Number	Description
8499084	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
10471297	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

Notations

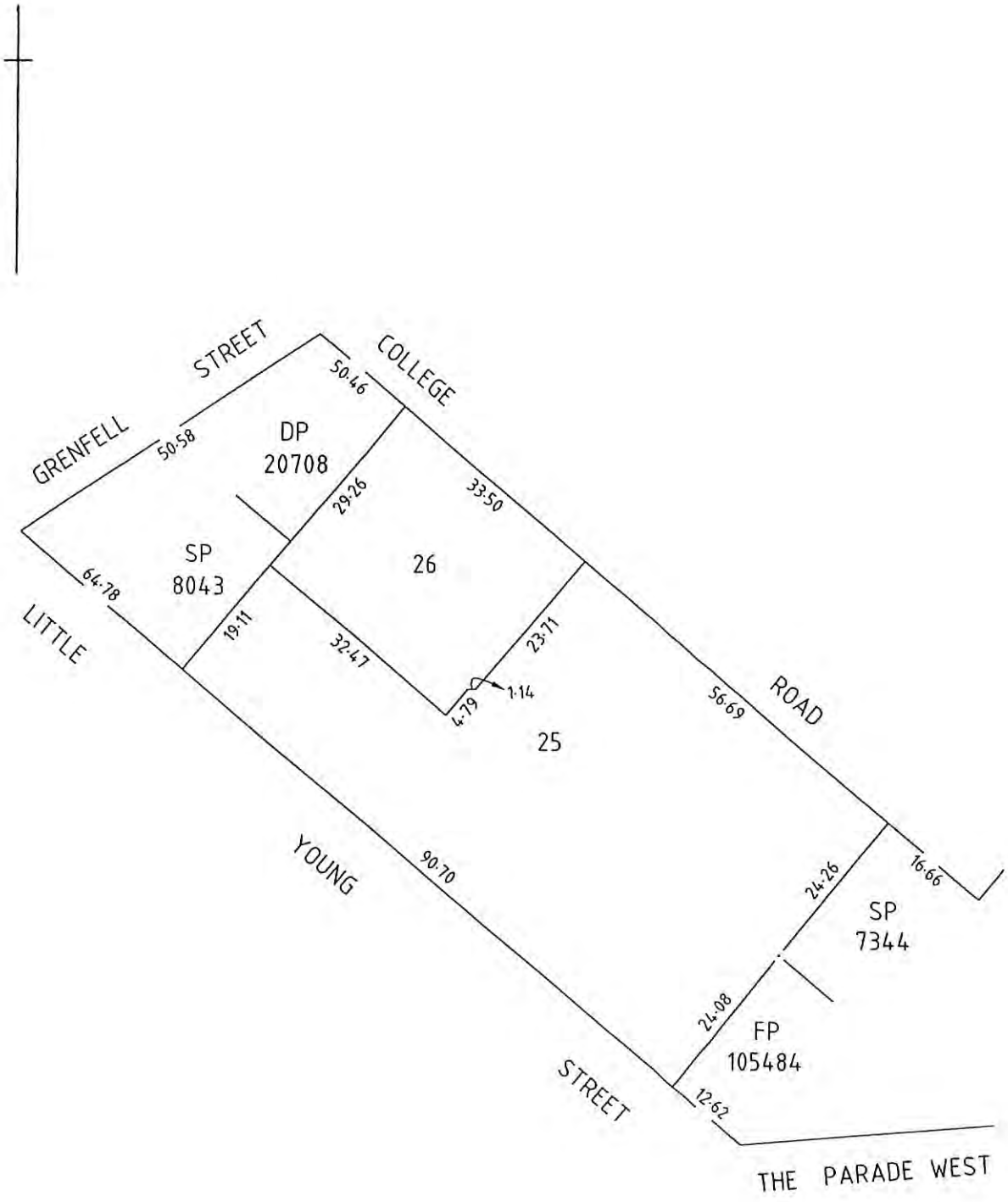
Dealings Affecting Title

NIL

Priority Notices

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Product	Register Search
Date/Time	02/11/2015 01:46PM
Customer Reference	
Order ID	20151102006437
Cost	$279.00



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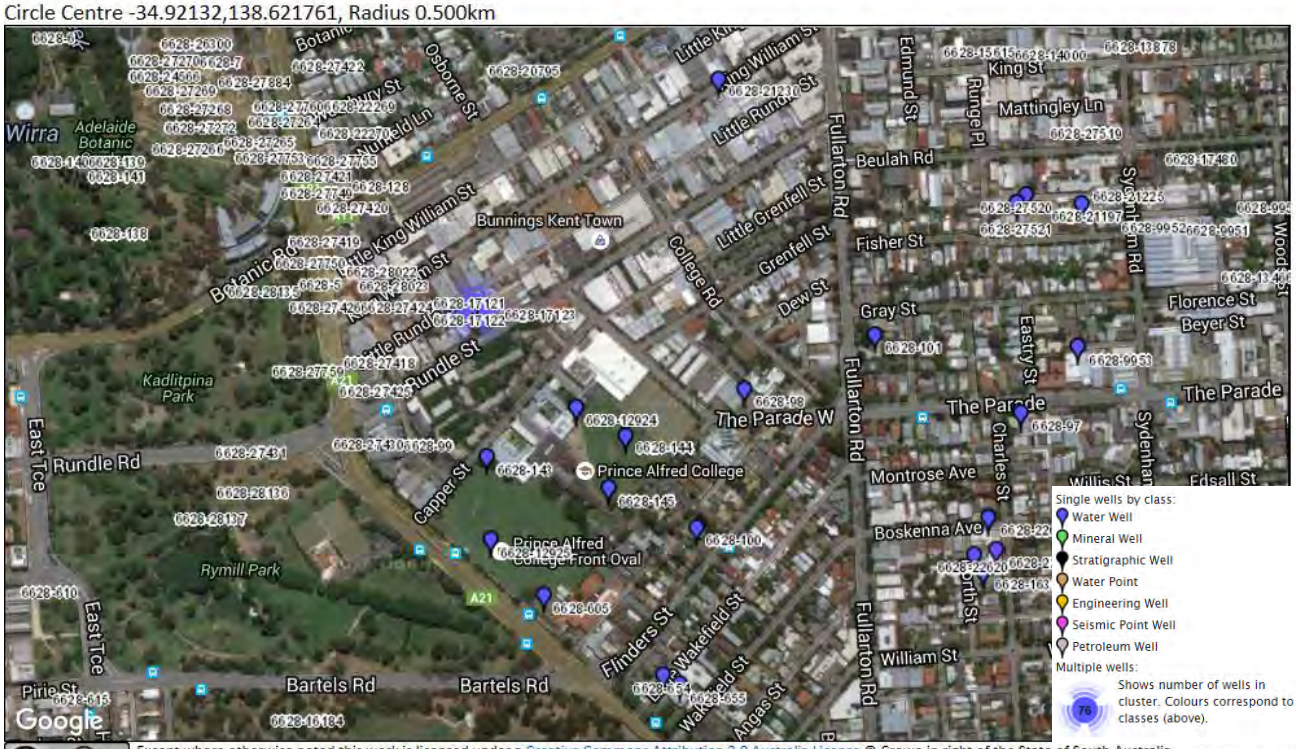
Appendix B. DEWNR groundwater data

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Government of South Australia

WaterConnect

Circle Centre -34.92132,138.621761, Radius 0.500km



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WaterConnect

Groundwater Data Report

Government of South Australia
Department of Environment, Water and Natural Resources

Circle Centre -34.92132,138.621761, Radius 0.500km

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	TDS (mg/L)	TDS Date	Date	Cased To (m)	Yield (L/sec)	Yield Date	Purpose	Obs No	SWL Status	Salinity Status	Aquifer	Status	Permit No
6628-97	11.99	11.99	9.25	19/07/1934	1028	19/07/1934											
6628-98	6.71	6.71			1257	09/10/1914											
6628-100	10.06	10.06			1499	10/12/1914											
6628-101	15.24	15.24			1100	28/10/1914											
6628-143	13.72	13.72			350	05/04/1976	01/01/1964	13.72	2.5	01/01/1976	OBS						
6628-144	39.62	39.62					01/01/1955	39.62	0.76	01/01/1976							
6628-145	22.86	22.86	7.95	21/09/1991	1245	15/01/1992	01/01/1971	22.86				ADE051	H	N	Qpah	NIU	
6628-605	27.43	0	7.05	21/11/1979	1105	18/12/1974	06/05/1968		2.27	06/05/1968		ADE026	H	H		BKF	
6628-654	18.9	0	8.53	17/10/1934	1128	17/10/1934										BKF	
6628-655	12.19	12.19			1885	20/11/1914											
6628-9953	14.02	14.02			1128	12/07/1934											
6628-12924	27	27	5.4	14/02/1984	1160	14/02/1984	14/02/1984	17.5	1.38	14/02/1984	TWS					OPR	13790
6628-12925	94.4	94.4	8.4	13/02/1984	1306	11/02/1984	13/02/1984	11	0.75	13/02/1984	TWS					OPR	13789
6628-16364	15	15			1010	06/01/1993	17/12/1992	15			DOM						27539
6628-17121	6.2	6.2					29/01/1995	6.2			INV						34057
6628-17122	7	7					29/01/1995	7			INV						34058
6628-17123	8	8					29/01/1995	8			INV						34059
6628-17124	10	10	4.3	28/01/1995			28/01/1995	10			INV						34060
6628-17125	7.7	7.7					29/01/1995	7.7			INV						34061
6628-21197	8	8					12/06/2003	5			INV						
6628-21230	11	11	8	07/01/2003			07/01/2003	11			MON						60544
6628-22619	8.5	8.5	5.2	26/07/2006			26/07/2006	8.5			INV						119364
6628-22620	9	9	5.2	26/07/2006			26/07/2006	6			INV						119365
6628-22621	6.2	6.2	3.6	27/07/2006			27/07/2006	3.2			INV						119366
6628-27520	9	9	6.8	18/09/2014				6			INV						236631
6628-27521	9	9	6.8	18/09/2014			18/09/2014	6			INV						236630

26 records

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Appendix C. Historical aerial photographs

Draft for client review



Photograph A: Site and surrounding area in 2005, showing approximate site boundary (source: DEWNR)



Photograph B: Site and surrounding area in 1999, showing approximate site boundary (source: DEWNR)



Photograph C: Site and surrounding area in 1989, showing approximate site boundary (source: DEWNR)



Photograph D: Site and surrounding area in 1979, showing approximate site boundary (source: DEWNR)



Photograph E: Site and surrounding area in 1968, showing approximate site boundary (source: DEWNR)



Photograph F: Site and surrounding area in 1959, showing approximate site boundary (source: DEWNR)



Photograph G: Site and surrounding area in 1949, showing approximate site boundary (source: DEWNR)

Appendix D. Dangerous goods licence search results

Draft for client review

Appendix E. Section 7 search results

Draft for client review

Environment Protection Authority
www.epa.sa.gov.au

GPO Box 2607 Adelaide SA 5001
250 Victoria Square Adelaide SA
T (08) 8204 2000 F (08) 8204 2020
Country areas 1800 623 445

Mott MacDonald
PO BOX 3400 Rundle Mall
ADELAIDE SA 5000

Rebecca.Lucock@mottmac.com.au

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@sa.gov.au

26 April, 2016

EPA STATEMENT TO FORM 1 - CONTRACTS FOR SALE OF LAND OR BUSINESS

The EPA provides this statement to assist the vendor meet its obligations under section 7(1)(b) of the *Land and Business (Sale and Conveyancing) Act 1994*. A response to the questions prescribed in Schedule 1-Contracts for sale of land or business-forms (Divisions 1 and 2) of the *Land and Business (Sale and Conveyancing) Act 1994* is provided in relation to the land.

I refer to your enquiry concerning the parcel of land comprised in

Title Reference	CT Volume 6130 Folio 16
Address	Allotment 25 (D49351), College Road, KENT TOWN SA 5067

Schedule – Division 1 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS OF MORTGAGES, CHARGES AND PRESCRIBED ENCUMBRANCES AFFECTING THE LAND

7. Environment Protection Act 1993

Does the EPA hold any of the following details relating to the *Environment Protection Act 1993*:

7.1	Section 59 - Environment performance agreement that is registered in relation to the land.	NO
7.2	Section 93 - Environment protection order that is registered in relation to the land.	NO
7.3	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
7.4	Section 99 - Clean-up order that is registered in relation to the land.	NO
7.5	Section 100 - Clean-up authorisation that is registered in relation to the land.	NO
7.6	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO
7.7	Section 103J - Site remediation order that is registered in relation to the land.	NO

7.8	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
7.9	Section 103P - Notation of site contamination audit report in relation to the land.	NO
7.10	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

Schedule – Division 2 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

3-Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

a)	details of a current licence issued under Part 6 of the *Environment Protection Act 1993* to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
b)	details of a licence no longer in force issued under Part 6 of the *Environment Protection Act 1993* to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
c)	details of a current exemption issued under Part 6 of the *Environment Protection Act 1993* from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
d)	details of an exemption no longer in force issued under Part 6 of the *Environment Protection Act 1993* from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
e)	details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land?	NO
f)	details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land?	NO
g)	details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land?	NO

h)	details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land?	NO

4-Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

a)	details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)?	NO
b)	details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*?	NO
c)	a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register?	NO
d)	a copy of a site contamination audit report?	NO
e)	details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies?	NO
f)	details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the *Environment Protection Act 1993?*	NO
g)	details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the *Environment Protection Act 1993?*	NO
h)	details of a notification under section 103Z(1) of the *Environment Protection Act 1993* relating to the commencement of a site contamination audit?	NO
i)	details of a notification under section 103Z(2) of the *Environment Protection Act 1993* relating to the termination before completion of a site contamination audit?	NO
j)	details of records, held by the former *South Australian Waste Management Commission* under the repealed *Waste Management Act 1987*, of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995?	NO

5-Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

a)	a copy of a report known as a "Health Commission Report" prepared by or on behalf of the *South Australian Health Commission* (under the repealed *South Australian Health Commission Act 1976*)?	NO
b)	details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the *Environment Protection Act 1993?*	NO
c)	details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the *Environment Protection Act 1993*?	NO

d)	a copy of a pre-1 July 2009 site audit report?	NO
e)	details relating to the termination before completion of a pre-1 July 2009 site audit?	NO

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

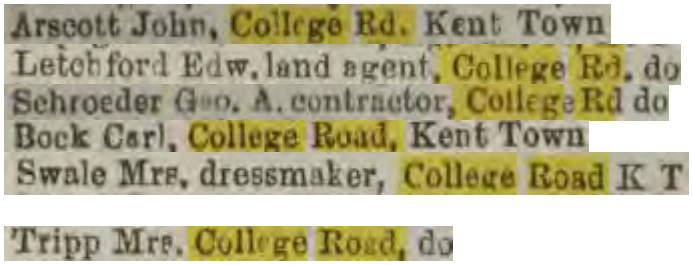
Appendix F. State Library of South Australia almanac and directory search results

Draft for client review

Table A: Summary of likelihood that snips relate to site of interest

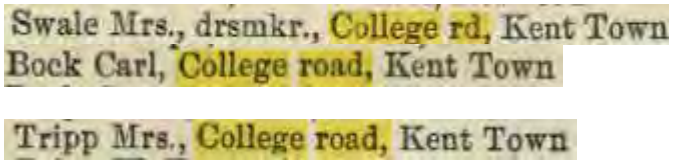
Year Span (Inclusive)	Likelihood	Explanation
1864-1870	N/A	No mention of College Road.
1871-1883	Very Low	No street summary, therefore could be anywhere on College Road.
1884-1893	First reference: Medium Second reference: High	No street numbering, however from interrogation of years following the first name listed has a medium likelihood of being situated on the site of interest and the second has a high likelihood of being situated on the site.
1894-1913	21: Medium 23: High	Street numbering provided. Street numbers are two lower than 1914 and beyond, seemingly due to a numbering change. Consistent resident names confirm probable change of numbering.
1914-1973	23: Medium 25: High 27: High	A historical aerial photograph of 1968 shows a vacant lot from, according to Sands and MacDougal, street number 19-27. Overlaying with the site of interest boundaries, it would seem as though street numbers 27 and 25 would have a high likelihood of being situated on the site of interest, and to best capture any uncertainty, 23 has also been included as having a medium likelihood of being situated on the site.

1871


Arscott John, College Rd. Kent Town
Letchford Edw. land agent, College Rd. do
Schroeder Geo. A. contractor, College Rd do
Bock Carl, College Road, Kent Town
Swale Mrs. dressmaker, College Road K T

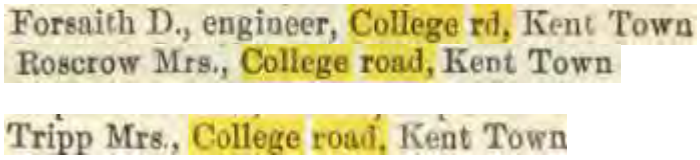
Tripp Mrs. College Road, do

1872


Swale Mrs., drsmkr., College rd, Kent Town
Bock Carl, College road, Kent Town

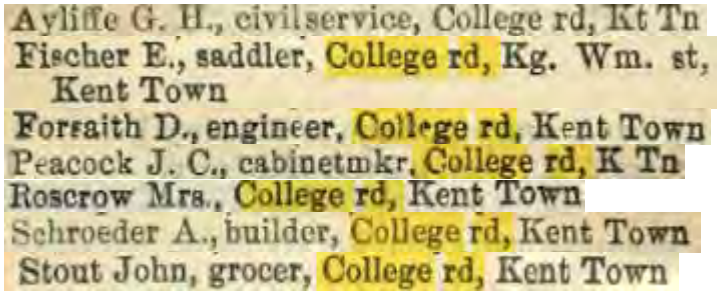
Tripp Mrs., College road, Kent Town

1873


Forsaith D., engineer, College rd, Kent Town
Roscrow Mrs., College road, Kent Town

Tripp Mrs., College road, Kent Town

1874


Ayliffe G. H., civilservice, College rd, Kt Tn
Fischer E., saddler, College rd, Kg. Wm. st, Kent Town
Forsaith D., engineer, College rd, Kent Town
Peacock J. C., cabinetmkr, College rd, K Tn
Roscrow Mrs., College rd, Kent Town
Schroeder A., builder, College rd, Kent Town
Stout John, grocer, College rd, Kent Town

Swale J. J., storeman, College rd, Kent Town
Thwaites W. Jas., College rd, Kent Town

1875

Abbott R., watchmaker, College rd., Kent Tn
Ayliffe G. H., civil service, College rd, Kt Tn
Martin H., ironmonger, College rd, Kt Tn
Nienhaber O. A., piano tnr, College rd, Kt Tn
Peacock J. C., cabinetmkr, College rd, Kt Tn
Stout John, grocer, College rd, Kent Town
Thorpe Henry, folder, College rd, Kent Twn

1876

Abbott R., watchmaker, College rd, Kent Tn
Bates W., ironmongers' asst, College rd, Kt Tn
Peacock J. C., cabint-mkr, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Sloan Walter, compositor, College rd, Kt Tn
Stout John, grocer, College rd, Kent Tn
Thorpe Henry, folder, College rd, Kent Twn

1877

Abbott R., watchmaker, College rd, Kent Tn
Bates W., ironmongers' asst, College rd, Kt Tn
Martin H. M., accountant, College rd, Kt Tn
Muirhead Robt, painter, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Sloan Walter, compositor, College rd, Kt Tn
Stout John, grocer, College rd, Kent Tn
Thorpe Henry, folder, College rd, Kent Twn

1878

Abbott R., watchmaker, College rd, Kent Tn
Hamilton A. R., architect, College rd, Kt Tn
Martin H. M., accountant, College rd, Kt Tn
Muirhead Robt, painter, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Thorpe Henry, folder, College rd, Kent Twn

1879

Abbott R., watchmaker, College rd, Kent Tn
Hamilton A. R., architect, College rd, Kt Tn
Muirhead Robt, painter, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Thorpe Henry, folder, College rd, Kent Twn

1880

Abbott R., watchmaker, College rd, Kent Tn
Barnes C., brewer, College Rd, Kent Town
Donaldson J. J., clerk, College rd, Kent Tn
Hamilton A. R., architect, College rd, Kt Tn
Moxon Arthur, b'kkeepr, College rd, Kt Tn
Priess A., gas fitter, College rd, Kent Town
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Tavener Mrs, drssmkr, College rd, Knt Twn
Thorpe Henry, folder, College rd, Kent Twn
Wilkins Thos, signpainter, College rd, Kt Tn

1881

Abbott R., watchmaker, College rd, Kent Tn
Barnes C., brewer, College Rd, Kent Town
Hamilton R. A., architect, College rd, Kt Tn
Hitchin G. P., clerk, College rd, Kent Town
Moxon Arthur, b'kkeepr, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Twn
Tavener Mrs, drssmkr, College rd, Knt Twn
Thorpe Henry, folder, College rd, Kent Twn

1882

Barnes C., brewer, College Rd, Kent Town
Dadswell T. D, plasterer, College rd, Kt Town
Hamilton R. A., architect, College rd, Kt Tn
Hitchin G. P., civil serv, College rd, Knt Twn
Moxon A., bookkeepr, College rd, Kent Tn
O'Mahoney John J., accountant, College rd
O'Mahoney P. J., civil engineer, College rd
Pittman Lambrook, coachtrimmer, College rd
Rendall J., compositor, College rd, Kent Tn
Tavener Mrs, drssmkr, College rd, Knt Twn
Tubbs Harry, vocalist, College rd, Knt Twn

1883

Barnes C., brewer, College Rd, Kent Town
Carlier Rchd B., butcher, College rd, Kt Tn
Chapman Miss, teacher, College rd, Knt Tn
Hitchin G. P., cvl srv, College rd, Knt Twn
Hughes Wm, bookslr, College rd, Knt Twn
Kennedy Hugh, grdnr, College rd, Kent Twn
Moxon A., bookkeepr, College rd, Knt Twn
O'Mahoney John J., accountant, College rd
O'Mahoney P. J., civil engineer, College rd

Pitman Sam, cochbldr, College rd, Knt Twn
Pittman Lambrook, coachtrimmer, College rd
Rendall J., compositr, College rd, Kent Twn
Tavener Mrs, drssmkr, College rd, Knt Twn
Thorpe Henry, printer, College rd, Knt Twn
Woolcock Elisha, crpntr, College rd, Knt Tn

1884 – Introduction of Kent Town summary, increase in likelihood of situation on site of interest

Davis, David, gentleman
Schmidt, Mrs James

1885

Davies, David

1886

Davies, David
Moore, Maurice, plasterer

1887

Davies, David
Burgess, Geo, modeller

1888

Davies, David
Burges, George, modeller

1889

Davies, David
Burges, George, modeller

1890

Simms, Harry, sharebroker
Burgess, George, modeller

1891

Simms, Harry, sharebroker
Burgess, George, modeller

1892

Combe, Harvey E, solicitor
Burgess, George, modeller

1893

Combe, Harvey E.
Burgess, George, modeller

1894 – increase in certainty of position on site due to the introduction of numbering

21 Combe, Harvey E.
23 Burgess, George, modeller

1895

21 Hitchcox, Jos
23 Burgess, Geo, modlr

1896

21 Hitchcox, Jos
23 Burgess, Geo, modlr

1897

21 Hitchcox, Mrs Frances
23 Burgess, Geo, modlr
Burgess, Mrs, strkpr

1898

21 Hitchcox, Mrs Frances

1899

21 Hitchcox, Mrs Frances
23 Burges, Mrs J.

1900

21 Hitchcox, Mrs Frances
23 Burges, Mrs J, strkpr

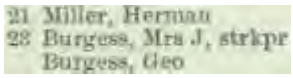
1901

21 Miller, Herman
23 Burges, Mrs J, strkpr
Burges, Jno

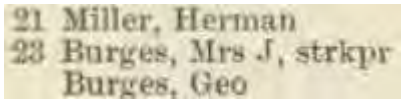
1902

21 Miller, Herman
23 Burges, Mrs J, strkpr
Burges, Geo

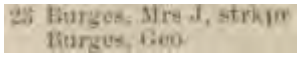
1903


21 Miller, Herman
23 Burgess, Mrs J, strkpr
Burgess, Geo

1904

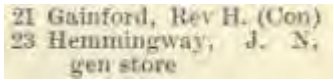

21 Miller, Herman
23 Burges, Mrs J, strkpr
Burges, Geo

1905

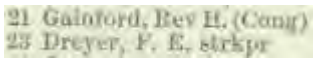

23 Burges, Mrs J, strkpr
Burges, Geo

1906

1907


21 Gainford, Rev H. (Con)
23 Hemmingway, J. N,
gen store

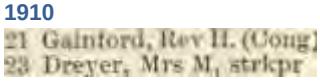
1908


21 Gainford, Rev H. (Cong)
23 Dreyer, F. E, strkpr

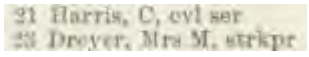
1909


21 Gainford, Rev H. (Cong)
23 Dreyer, Mrs M, strkpr

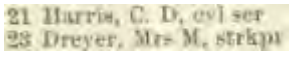
1910


21 Gainford, Rev H. (Cong)
23 Dreyer, Mrs M, strkpr

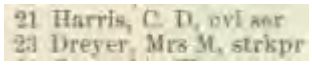
1911


21 Harris, C, cvl ser
23 Dreyer, Mrs M, strkpr

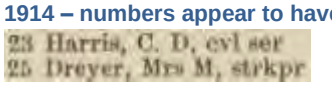
1912


21 Harris, C. D, cvl ser
23 Dreyer, Mrs M, strkpr

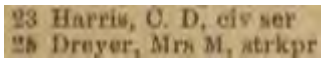
1913


21 Harris, C. D, cvl ser
23 Dreyer, Mrs M, strkpr

1914 – numbers appear to have been increased by two


23 Harris, C. D, cvl ser
25 Dreyer, Mrs M, strkpr

1915


23 Harris, C. D, civ ser
25 Dreyer, Mrs M, strkpr

1916


23 Harris, C. D, civ ser
25 Dreyer, Mrs M, strkpr

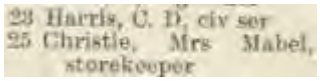
1917


23 Harris, C. D, civ ser
25 Dreyer, Mrs M, strkpr

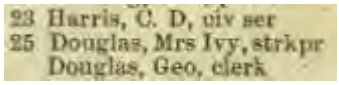
1918


23 Harris, C. D, civ ser
25 Hawkes, R. G, strkpr

1919


23 Harris, C. D, civ ser
25 Christie, Mrs Mabel, storekeeper

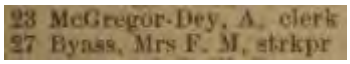
1920


23 Harris, C. D, civ ser
25 Douglas, Mrs Ivy, strkpr
Douglas, Geo, clerk

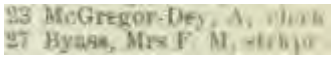
1921


23 Harris, C. D, civ ser

1922


23 McGregor-Dey, A, clerk
27 Byass, Mrs F. M, strkpr

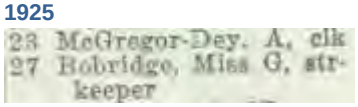
1923


23 McGregor-Dey, A, clerk
27 Byass, Mrs F. M, strkpr

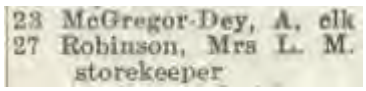
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23 McGregor-Dey, A, clk
27 Bobridge, Miss G, str-keeper

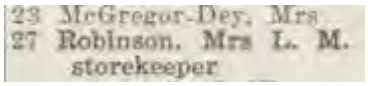
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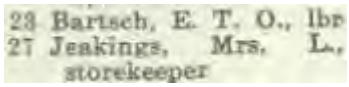
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27 Robinson, Mrs L. M. storekeeper

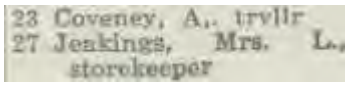
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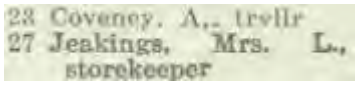
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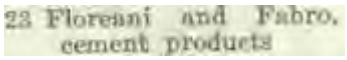
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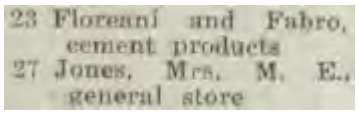
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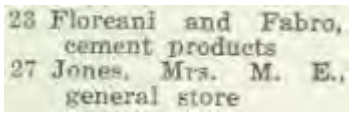
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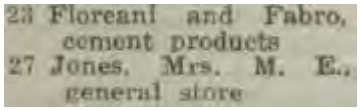
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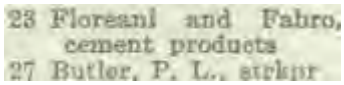
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1934



1935



1936



1937

21-23 Smith, —.
27 Willoughby, T. J., mx bns and milk depot

1938

21-23 Smith, G.
Stanley, Mrs. I. L.
Proser, —
Willoughby, Mrs B.A.
27 Hocking, M. M.

1939

21-23 Waldron, Mis
27 Hocking, M. M.

1940

21-23 Waldron, Miss
27 Hocking, M. M.

1941

21-23 Waldron, Miss
27 Hocking, M. M., mxd business

1942

21-23 Flats
27 Hocking, M. M., mxd business

1943

21-23 Flats
27 Cogan, Mrs

1944-45

21-23 Flats
27 Cogan, Mrs., mxd bus

1946

21-23 Flats
27 Hughes, G. I., mxd bs

1947

21-23 Flats
27 Hughes, G. I., mxd bs

1948

21-23 Flats
27 Hughes, G. I., mxd bs

1949

23 Archer, Miss E. M.
23 Merton, O., rl emp
23 Blacketer, H.
23 Prosser, W. G.
23 Hughes, L. V., txi dvr
27 Miller, J. J., mxd bus

1950

23 Archer, Miss E. M.
23 Merton, O., rl emp
23 Blacketer, H.
23 Prosser, W. G.
23 Hughes, L. V., txi dvr
27 Miller, J. J., mxd bus

1951

23 Archer, Miss E. M.
23 Merton, O., rl emp
23 Blacketer, H.
23 Prosser, W. G.
23 Blinman, Mrs, D. B.
27 Constant, A. K., mxd bsns

1952

23 Archer, Miss E. M.

23 Merton, O., rl emp
3 Blacketer, H.
23 Prosser, W. G.
23 Blinman, Mrs. D. B.
27 Constant, A. K., mxd bsns

1953

23 Archer, Miss E. M.

23 Merton, O., rl emp
3 Blacketer, H.
23 Prosser, W. G.
23 Blinman, Mrs, D. B.
27 Constant, A. K., mxd bsns

1954

23 Merton P R dneng tchr
23 Blinman Mrs D E
27 Constant A K mxd bsns

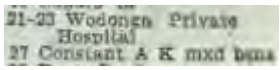
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21-23 Wodonga Private Hospital
27 Constant A K mxd bsns

1956

21-23 Wodonga Private Hospital
27 Constant A K mxd bsns

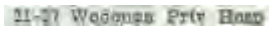
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1958



1959



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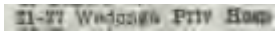
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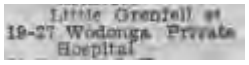
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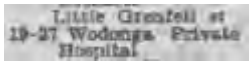
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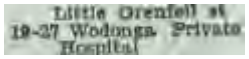
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1966



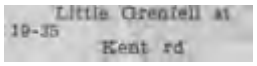
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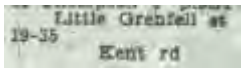
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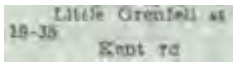
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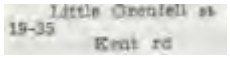
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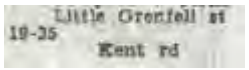
1971



1972



1973



Appendix G. Asbestos register

Draft for client review

ANNEXURE E

Asbestos Register

Carters
Asbestos Management

REGISTER: AS 1976

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
A. Building external eaves lining (facing north east, level 3) – fibre cement sheet set on a 45 degree angle.	Approx 24m² Limited access	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

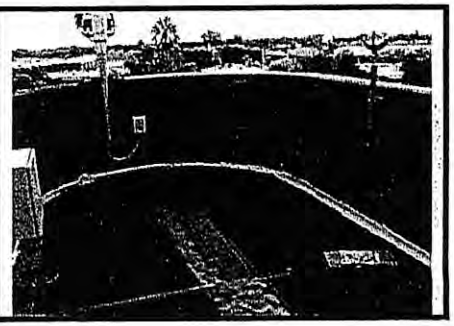
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Good Sealed Non friable	Sample 01/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

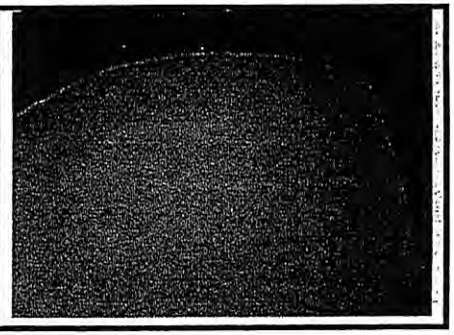
Low Risk P4 –Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Note the tower containing the A/C duct appeared to have a new rubber membrane coating to the tower surface. The presence of asbestos membrane at this tower could not be verified.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B1. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Poor Unsealed Non friable	Sample 01/GS/270412.	Not required

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

December 2012 – Asbestos Maintenance Works completed on the North Tower where access had been restricted per management plan adopted from April 2012 update. North tower has been made safe / vacuumed dust / debris and wet wiped floor area under monitored conditions, before applying a paint base coat to seal the membrane floor area only. Refer to certificate of completion form and air-monitoring clearance report 13/12/12, emailed to building owner for inclusion into the register.
April 2012 - High Risk P2 Restrict access. Dust residue and debris visible on roof from high traffic use. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Asbestos Approved Code of Practice". Recommend implement a safe access system to prevent further abrasion damage to the surface.



Asbestos Audit update after new tower removal work.

Carters
Asbestos Management

- **Asbestos Registers & Annual Updates**
- **Asbestos Repairs & Maintenance**
- **Asbestos Training & Support**
- **Asbestos Removal**
- **Asbestos Advice & Consultancy**
- Asbestos Safety Products

CERTIFICATE OF COMPLETION (MAINTENANCE)

DATE OF WORK	12/12/2012	REGISTER or JOB No.:	1979	ENQUIRY No.:	12219
PERSONS CARRYING OUT WORK	Willie Harris				
PROPERTY ADDRESS	Bureau of Meteorology, 25 College Road, Kent Town				
NAME OF CLIENT AUTHORIZING WORK TO PROCEED	Mr John Squarcini				

Work Carried Out (Brief Scope)

North tower make safe – vacuum, scrub / wet wipe surface of asbestos containing bituminous membrane floor covering of the under air monitored conditions.
Once all clear given, paint seal bituminous floor covering (base coat) 12/12/2012.
Apply second / final paint coat 13/12/2012

TICK	ITEM NO'S	DESCRIPTION OF WORK
☐		Item removed in accordance with "Approved Code of Practice".
☒	B	Dust and debris cleaned up using approved asbestos rated vacuum system in accordance with "Approved Code of Practice".
☐		Asbestos waste collected and disposed of in accordance with EPA requirements.
☒	B	Item made safe in accordance with "Approved Code of Practice".
☒	B	"All Clear" air monitoring certificate attached (where applicable).
☐		Caution signs installed in accordance with safe work method and SOP.
☐		Samples taken in accordance with safe work method and SOP.
☐		Other (SPECIFY)

Standard Operating Procedure Used / Safe Work Method

☐ SOP 3.2 **Removal of Asbestos Cement and Resin Boards**	☐ SOP 3.3 **Removal of Vinyl Tiles**	☒ SOP 3.5 **Vacuum Use**
☒ SOP 3.6 **Making Safe Asbestos Containing Materials**	☐ SOP 3.7 **Transport and Disposal of Waste**	☐ SOP 3.8 **Collection of Waste**
☐ SOP 3.9 **Installing Caution Signs**	☐ SOP 3.10 **Installing Register Holder**	☐ SOP 1.3 **Sample Taking**
☐ OTHER		

Job Notes / Qualifications / Limitations of Removal (if any - Use back of sheet for further notes if required)

Signed : WGH **Date:** 13-12-2012

Carter Corporation Pty Ltd 42 Trenbath Street Bowden SA 5007
P (08) 8346 2999 F (08) 8346 3888 E enquiries@cartercorporation.com.au W www.cartercorporation.com.au
ABN 58 007 881 763 Asbestos Lic 72803 EPA Lic 13933 AS4801 OH&S Accredited

Adelaide Asbestos Audits & Monitoring

REPORT OF ANALYSIS

Report Number:	**RN 01644**	**Client Order Number:**	AS1979e12219WH
Reference Code:	CART01-121212-MS	**Approval Number:**	n/a

Air monitoring in accordance with the National Occupational Health and Safety Commission guidance note on the membrane filter method for estimating airborne asbestos dust was carried out concluding on the **12-Dec-12**

at **Bureau of Meteorology 25 College Road Kent Town**

on behalf of **Carter Corporation**

The spreadsheets of results attached, indicate that during the monitoring sessions the areas tested were well below the Worksafe Australia Exposure Standard of 0.1 fibres /mL.

This report should not be considered as a contractual document and should not be reproduced except in full.

Mark Seater
Approved Analyst
12-Dec-12

Adelaide Asbestos Audits Monitoring
49 Heath Street, Birkenhead SA 5015
Mobile: 040 040 1972 Fax 08 8242 4969
E-mail: adelaideasbestos@bigpond.com.au

Adelaide Asbestos Audits and Monitoring

AIRBORNE ASBESTOS FIBRE MONITORING

Site: Bureau of Meteorology 25 College Road Kent Town

Client: Carter Corporation **Date:** 12-12-2012

Job Name: CART01-121212-MS **Approval:** n/a **LRN:** 12-000353

Location	Activity	Time On	Run Time	Flow Rate (ml/min)	Fibres Conc. (per mL)
Northern tower stairwell	G	0822	135	3000	<0.01
Northern tower roof	G	0822	135	3000	<0.01

G = Background C= Clearance F = Final Clearance B= Waste Removal
S = Plastic Stripdown

The Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Source D Update) 2003 [NOHSC:1003(1995)] requires a Fibre Concentration of no more then 0.1 fibres per mL

Analyst: Mark Seater

49 Heath Street Birkenhead 5015
Tel: 040 040 1972 Fax: +61 8 8242 4969

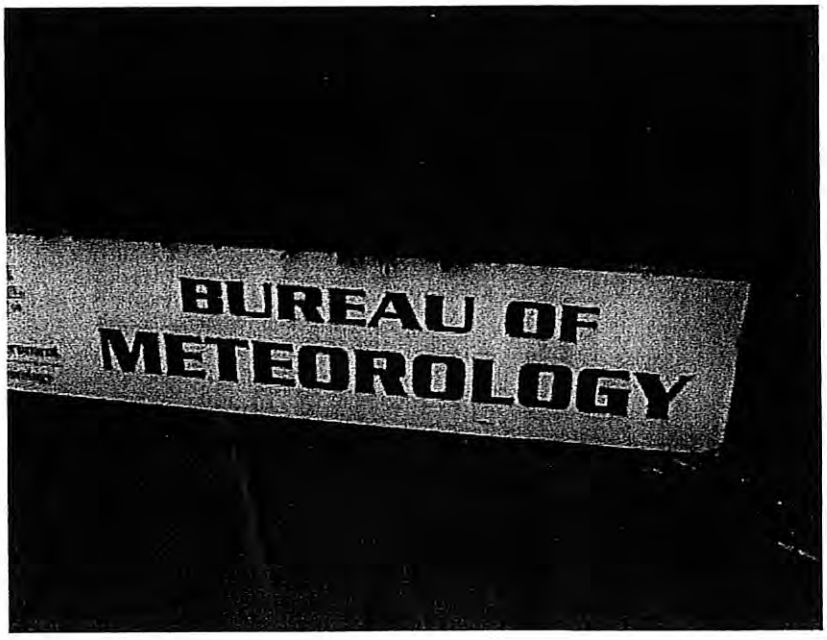
Procedure: AAAM - 01

Carters
Asbestos Management

- Asbestos Audits.
- Asbestos Management.
- Asbestos Consultancy.
- Asbestos Maintenance.
- Asbestos Training.
- Asbestos Safety Products.

ASBESTOS AUDIT

REGISTER NO.:	**AS1979**
FOR THE PROPERTY AT:	**Bureau Of Meteorology** **25 College Road** **Kent Town, SA**
CLIENT:	**Squarcini Group of Companies**
REGISTER CONTROLLER:	**Mr John Squarcini**
CONSULTANT:	**George Sheaffer**
DATE INSPECTED:	**27/04/2012**



CARTER CORPORATION PTY. LTD.
42 Trembath Street, Bowden, SA 5007
Ph. (08) 8346 2999 Fax. (08) 8346 3888
Email: enquiries@cartercorporation.com.au
Web: www.cartercorporation.com.au
ABN 58 007 881 763

CONTENTS

		Page
1	INTRODUCTION	1
2	SCOPE OF WORKS	1
3	LIMITATIONS	2
4	METHODOLOGY	3
5	EXAMPLES OF ASBESTOS CONTAINING MATERIALS	4
6	DEFINITIONS	5
7	RISK SCORE CALCULATOR	7
8	REFERENCE	8

APPENDICES

APPENDIX A – ASBESTOS REGISTER

APPENDIX B – CERTIFICATES OF ANALYSIS

APPENDIX C – REGISTER DRAWING

APPENDIX D – FORMS

1. INTRODUCTION

Carter Corporation Pty Ltd (Carter Corporation) was requested to conduct an asbestos re-inspection audit to determine the condition of asbestos containing materials (ACMs) previously identified within the asbestos register at the site/address referred to and contained within this document. The purpose of the audit was to identify and record the location of asbestos containing materials (ACM) and assess the condition as required by the State/Territory Regulations (Refer Section 8 Reference).

The audit is a visual re-inspection of previously identified asbestos materials listed in the original register and is not a full inspection of the building. All previous conditions, limitations and recommendations apply.
full inspection of the building. All previous conditions, limitations and recommendations apply.

In accordance with the Regulations, ACMs which have been visually identified (i.e. not sampled or not referenced to a specific sample) should be presumed to contain asbestos, unless sampled to prove otherwise.

It is strongly recommended that this report be reviewed prior to any change of use, occupancy or other activity which may affect the accessibility of any ACMs within the areas surveyed. Such reviews should only be conducted by a competent person.

Further investigations may be required prior to any planned refurbishment or alterations which affect the fabric of the building.

This report may not be reproduced other than in full, except with the prior written approval of the report author.

This report should be read in its entirety.

This report is limited to asbestos containing materials only and their associated risks. Reference may be made within this document to other materials such as but not limited to Synthetic Mineral Fibre (SMF); lead paints etc but no assessment of these have been made.

The objective of the survey was to, as far as reasonably practicable, locate, identify and access and where possible, photograph and quantify all accessible ACM present within the scope of the survey and to present the information collected in a way which allows the duty holder to manage the risks arising from those materials.

2 SCOPE of WORK

To undertake the inspection as required, the following scope of work was undertaken;

- A desktop survey and discussion with site personnel was made to determine the history, previous use, existing asbestos register and previous removals of ACM.
- A site specific risk assessment prior to the survey was undertaken.
- Inspection of the site was carried out.
- Potential ACM their location, type, quantity, condition and stability were documented.
- An assessment of the materials potential to release fibres and recommendations to minimise or manage the risk was noted.
- Photographs were taken (where required) to aid the item identification and condition.
- Signage requirements were noted.
- Samples (where agreed) taken and submitted to a NATA laboratory for analysis to qualify asbestos fibre content.
- Drawings (where supplied) marked up to aid the asbestos location identification.

3 LIMITATIONS

Whilst the surveyors make every reasonable effort, Carter Corporation cannot guarantee that all ACMs have been identified and survey results are definitive. Some ACMs could be present in the building that may only be discovered when the building is demolished or is subject to major refurbishment.

Building owners are not required to dismantle parts of the building or plant to locate asbestos; the regulation is aimed at identifying any significant risk to persons. If it is the intention to demolish or alter such areas, and concealed/unknown asbestos is uncovered / detected, revised safe work practices are to be implemented.

In general, it may be impossible to locate all asbestos during the conduct of a visual inspection. Physical constraints upon an inspection include, but are not limited to, restrictions on access to lift shafts / motor rooms, air conditioning ductworks, During an inspection, there is a need to avoid damage to client's property (e.g. through sample taking) and to minimise disruption (e.g. dismantling equipment), and inconvenience.

The inspection was carried out in areas where access was available. Unless otherwise indicated floor coverings were not taken up to enable inspection of floor surfaces. Equipment in use was not disturbed or opened for the purpose of inspection. Air-conditioning systems, heater banks and associated ductwork has not been inspected.

In some instances asbestos may be located in inaccessible areas such as wall cavities, beneath floor slabs, or as an integral part of machinery, plant or equipment (pumps, pipe work, boilers, heater banks, ductwork and the like). Buried fibro asbestos pipes or pits may also be discovered upon excavation.

Confirmation of lagged pipe work within wall cavities and chased into walls is not possible with a visual inspection. Asbestos that was previously removed from an area may have fallen down cavities due to inadequate removal procedures and clean-up. This should be taken into consideration when any demolition or upgrade work is being done as it is possible that asbestos containing material may be present in these areas.

Unless noted otherwise, samples were not taken of those products which have previously been known to contain asbestos, e.g., "Zelemite" electrical switchboard panels and "Millboard" insulation to wiring (items installed in live electrical situations).

Notes: Any references in this report to materials other than asbestos are not to be taken as necessarily accurate, since identification of such materials is not included within the scope of this report. References to "Colorbond", "PVC", "Rockwool", "Gyprock"', etc are intended to be an approximate indication only of the type of material present based on cursory observation. The purpose of including references to such materials is primarily to assist the author in compiling the report and secondly to provide a more descriptive report.

Measurements and quantities mentioned in this report are approximate only.

This report is not to be used as a contractual document.

No guarantees can be entered into regarding the accuracy or completeness of this report.

The information contained herein is accurate at the time of printing only. Subsequent updates become the responsibility of the register controller.

A reference in this register to the regulations, a Code of Practice, a Guidance Note or Guideline will be taken as a reference to that document as in force at that time.

A reference in this register to the owner of a building will be taken to include a reference to any person appointed by the owner to manage the building on his or her behalf.

4 METHODOLOGY

All accessible areas were thoroughly inspected in order to determine the presence of ACM and findings pertaining to type, condition and extent of the ACM recorded.

To assess the potential health risk posed by the ACM various information and criteria are recorded. The assist in the interpretation of the Asbestos Register the following detailed explanation is provided.

- **LOCATION – DESCRIPTION;** provides identifier (letter for external and number for internal). The identifier is also shown on any drawing provided with the Register. The description states the room number (if assigned), room name, location of the item and material description.

- **EXTENT;** an approximate extent (not be used for pricing or demolition costing).

- **ACCESSIBILITY;**
  Accessible – the material/item can be easily accessed without any aids or key access.
  Limited access – the material/item can by accessed but requires access via ladder, key access, lifting carpet, etc.
  Inaccessible – the material/item cannot be accessed without damage or demolition i.e. metal encapsulated insulation, material within cavity, sealed door core etc.

- **ASBESTOS ASSESSMENT;** asbestos type (from laboratory analysis) or presumed asbestos content.

- **CONDITION;** provides a description of the material at the time of the survey. It comprises of three components-
  Poor – the material is damaged or severely deteriorated.
  Moderate – the material is generally sound condition but has some signs of deterioration.
  Good – The material is sound with no signs of deterioration

  Sealed – the material has a painted or other material sealing the raw product
  Unsealed – the material is raw or has exposed areas of asbestos product

  Non-friable/bonded – the asbestos fibres are in a stable matrix and cannot be crushed by hand application
  Friable – the asbestos product can be crushed or broken down by hand pressure or is dust/debris

- **SAMPLE NO – VISUAL TEST;** provides the unique sample reference number or informs of a visual identification.

Items listed within the Register as "visual" have not been sampled to confirm an asbestos content. These items have been identified as materials which historically have or can contain asbestos. The presumption made is through various criteria such as but not limited to type of material, age of building, similar products, and the experience of the surveyor. All materials which have been listed as visually identified within this register must be treated as asbestos unless proven otherwise by sample analysis. It is recommended that all materials are sampled in order to qualify.

- **SIGNAGE STATUS;** signage is either visible or not visible.

- **SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS;** has specific notes pertaining to the item with recommendations if required. Within this section there is also information relating to Risk Priority. The information gained from the survey or inspection is used to provide a priority rating and is to be used as part of the Asbestos Management Plan. Refer to Section 7 'Risk Score Calculator' for the risk score matrix used within the Register. The matrix is based upon AS4360.

5 EXAMPLES OF ASBESTOS CONTAINING MATERIALS

(This is not an exhaustive list)

Backing to service riser doors
Bitumen based membrane coverings/flashings
Boiler insulation
Brake linings
Cable trays
Chalkboards
Cooling towers
Door linings
Down pipes and gutters
Duct work flexible fabric connections
Eaves/Verandah linings
Electrical cable insulation/sheathing
Electrical meter backing boards
Exhaust insulation and gaskets
Expansion joints and gaskets in boilers
Facades
Fencing
Fibre cement pipes and flues
Fire blankets
Fire doors - internal core
Firewall partitions
Fuse holder insulation
Heater bank/re-heat units insulation within duct work of air conditioning
Hot water service heat shields
Insulation linings for spark/fire resistance
Kitchen plant and equipment
Laboratory gloves
Laboratory hoods, bench tops, and equipment
Lift motor brakes
Limpet insulation to structural beams & columns
Lost form work
Louvres in windows
Mortar in wall and floor penetrations (fire stop)
Oven door seals
Packers under floor joists (for levelling transportables, etc)
Pipe work gaskets
Putty and tapes in expansion joints, construction mastics
Refractory bricks
Residual contamination on ceiling tiles and grids
Roof cladding
Roofing shingles
Sealants to duct work and other air-conditioning plant and equipment
Sheathing/insulation to wiring
Sheeting to wet areas
Taping compounds (thermal)
Textured paints/coatings
Thermal paper products
Vermiculite insulation/decorative plaster finishes
Vinyl floor (lino) backing material
Vinyl floor tiles
Wall and floor penetrations
Wall cavities
Wall linings/cladding

6 DEFINITIONS

Accredited laboratory	A testing laboratory accredited by the National Association of Testing Authorities, Australia (NATA) or a similar accreditation authority, or otherwise granted recognition by NATA, either solely or in conjunction with one or more other persons.
Accessible	In a physical location where building occupants or users might readily access material without use of assistance e.g. asbestos based material used as wall cladding on or outside of equipment in a laboratory etc.
Air monitoring	Airborne asbestos fibre sampling to assist in assessing exposures and the effectiveness of control measures. Air monitoring includes exposure monitoring, control monitoring and clearance monitoring. Note: Air monitoring should be undertaken in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003 (2005)].
Airborne asbestos fibres	Any fibres of asbestos small enough to be made airborne. For the purposes of air monitoring airborne fibres, only respirable asbestos fibres are counted.
Asbestos	The fibrous form of mineral silicates that belong to the serpentine or amphibole groups of rock forming minerals, including Actinolite, Amosite (brown asbestos), Anthophyllite, Crocidolite (blue asbestos), Chrysotile (white asbestos) and Tremolite, or any combination of two or more of these.
Asbestos Abatement	Procedures to control fibre release from asbestos containing materials in a building or to remove it entirely. These may involve removal, encapsulation, repair, enclosure, encasement, and operations and maintenance programs.
Asbestos register	The document containing the results/recommendations following a building audit for asbestos materials, commenting on their location, condition and establishment of safe working policies.
Asbestos removal work	Work involving the removal of a) insulation material that consists of or contains asbestos, or other friable asbestos-containing material; or b) an asbestos-cement (fibro) product, or other non-friable asbestos-containing material.
Asbestos work	Any work where, in the course of that work, exposure to asbestos (or any material that consists of or contains asbestos) may occur.
Asbestos Containing Material (ACM)	Means any material, object, product or debris that contains asbestos.
Asbestos removalist	A competent person who performs asbestos removal work. An asbestos removal licence is required for removal of friable ACM and may also be required for non friable ACM removals, check with relevant OHS authorities for requirements.
Asbestos waste	All removed ACM and disposable items used during the asbestos work, such as plastic sheeting used to cover surfaces in the asbestos work area, disposable coveralls, disposable respirators, rags used for cleaning.
Asbestos work area	An immediate area in which work on ACM is taking place. The boundaries of the asbestos work area must be determined by a risk assessment.
Avoid physical and mechanical damage	As for as practicable, limit activities (cutting, drilling, grinding, sanding, breaking, etc) on or adjacent to material such that sufficient damage to release respirable fibres is avoided.
Breathing zone	A hemisphere extending in front of a persons face, with a radius of 300mm from the midpoint of an imaginary line between the ears.

Competent person	A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of the specific work.
Dust and debris	Visible particles, fragments or chunks of material, large and heavy enough to have settled in the work area, that is likely to have originated from ACM.
Friable (Asbestos)	Asbestos containing material which, when dry, is or may become crumbled, pulverised or reduced to powder by hand pressure.
Hazard	Any matter, thing, process or practice that may cause death, injury, illness or disease.
Inaccessible areas	Areas which are difficult to access, such as wall cavities and the interiors of plant and equipment.
Limited Access	Requiring some assistance or equipment to allow access e.g. requiring a ladder or lifting of ceiling tiles or keys to normally locked cupboard, room etc.
Monitor Condition	Carry out regular general observation of condition of material to note any changes.
NES	National exposure standard
N.O.H.S.C.	The National Occupational Health and Safety Commission (Government Body).
Organic fibre	Fibres such as but not limited to cellulose, wool, cotton
Person with control	In relation to premises, a person who has control of premises used as a workplace. The person with control may be: a The owner of the premises b A person who has, under any contract or lease, an obligation to maintain or repair the premises c A person who is occupying the premises d A person who is able to make decisions about work undertaken at the premises, or An employer at the premises
Personal Protective Equipment	Equipment and clothing that is used or worn by an individual person to protect themselves against, or minimise their exposure to, workplace risks.
Register Controller	A building owner or designated representative who is responsible for the asbestos register and implementation of a hazard management plan.
Risk	The likelihood of a hazard causing harm to a person. In this instance rick relates to illness or disease arising from exposure to Airborne Asbestos Fibres.
SMF	Synthetic Mineral Fibre
Stable	Condition good, posing minimum risk to health.
Unstable	Condition poor, posing significant risk to health.
Work	Any activity, physical or mental, carried out in the course of a business, industry, commerce, an occupation or a profession.
Worker	A person who does work, whether or not for reward or recognition.
Workplace	Any place where a person works.

7 RISK SCORE CALCULATOR

Consequence or Impact

Rating	Descriptor	Example Detail Description
1	Insignificant	No illness will result as asbestos is stable, therefore there is little likelihood of inhaling fibres above normal ambient levels.
2-3	Minor	Local fibre release only and in amounts and fibre size that are unlikely to cause latent asbestos related illness
4-6	Moderate	Asbestos may be unstable and could release fibres in the amount and size that may cause latent asbestos related illness
7-8	Major	Asbestos is unstable and will release fibres in the amount and size that will cause latent asbestos related illness
9	Catastrophic	Asbestos is highly friable and unstable, fibres will be released in size range and amount that are highly likely to cause latent asbestos related illness

Likelihood of Exposure

Rating	Descriptor	Description
9	Almost Certain	Is expected to occur in most circumstances – i.e. people regularly in the vicinity.
7-8	Likely	Will probably occur in most circumstances.
4-6	Possible	Might occur at some time.
2-3	Unlikely	Could possibly occur at some time but is unlikely.
1	Rare	May occur only in exceptional circumstances.

Risk Calculator

	Consequence or Impact				
Likelihood	9	7-8	4-6	2-3	1
9					
7-8					
4-6				Medium	Low
2-3			Medium	Low	Low
1			Medium	Low	Low

Risk **Priority with recommended action**

Extreme **P1** – Restrict access and isolate material immediately. Plan for removal as soon as practicable (less than 1 month). The identified material presents an immediate occupational/environmental risk in its present condition.

High **P2** – Limit access as an interim measure and identify for planned removal (less than 3 months). The identified material presents a potential occupational/environmental risk in its present condition.

Medium **P3** – Identify for removal where maintenance or refurbishment may cause disturbance of the material. Treat material (make safe, seal) to prevent potential fibre release as an interim measure.

Low **P4** – Leave in situ and reassess condition on at least an annual basis as required by current OHS&W Regulations. Consider removal when maintenance or refurbishment may cause disturbance of the material. The identified material presents a low occupational/environmental risk in its present condition unless acted upon

8 REFERENCE

ACT	Work Safety Act 2008 Work Safety Regulation 2009
NSW	Occupational Health and Safety Act 2000 Occupational Health and Safety Regulation 2001 Div 4
NT	Workplace Health and Safety Act Workplace Health and Safety Regulations Pt 12 Div 2
QLD	Workplace Health and Safety Act 1995 Workplace Health and Safety Regulation 2008
SA	Occupational Health, Safety and Welfare (SafeWork SA) Amendment Act 2005 Occupational Health, Safety and Welfare Regulations 2010
TAS	Workplace Health and Safety Act 1995 Workplace Health and Safety Regulations 1998 Div 9
VIC	Occupational Health and Safety Act 2004 Occupational Health and Safety Regulations 2007 Div 5
WA	Occupational Safety and Health Act 1984

Asbestos Code of Practice for the Management of Asbestos in the Workplace [NOHSC: 2018 (2005)]

Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC: 2002 (2005)]

Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)]

STATE AND TERRITORY WORK HEALTH AND SAFETY AUTHORITIES;

ACT	**Website**: www.worksafety.act.gov.au **Email**: worksafety@act.gov.au **Telephone**: (02) 6205 0333
NSW	**Website**: www.workcover.nsw.gov.au **Telephone**: 13 10 50
NT	**Website**: www.worksafe.nt.gov.au **Email**: ntworksafe@nt.gov.au **Telephone**: 1800 019 115
QLD	**Website**: www.worksafe.qld.gov.au **Telephone**: 1300 369 915 or (07) 3225 2000
SA	**Website**: www.safework.sa.gov.au **Telephone**: 1300 365 255
TAS	**Website**: www.workcover.tas.gov.au **Email**: wstinfo@justice.tas.gov.au **Telephone**: 1300 366 322 (inside Tasmania) or (03) 6233 7657 (outside Tasmania)
VIC	**Website**: www.workcover.vic.gov.au **Email**: info@worksafe.vic.gov.au **Telephone**: 1800 136 089 or (03) 9641 1444
WA	**Website**: www.worksafe.wa.gov.au **Telephone**: 1300 307 877 Part of the WA Department of Commerce

Appendix A – ASBESTOS REGISTER

Carters
Asbestos Management

REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

BUILDING – BUREAU OF METEOROLOGY

ANNUAL UPDATE INSPECTION SPECIFIC NOTES –

2012 Audit Notes

A copy of the site register was not located on site. However a copy of the 2011 register was provided at the request of Mr. Kevin Godfrey at the time of audit.
During this audit, additional consultancy and sampling was conducted to the Tower bituminous waterproof floor covering as requested.

2011 Audit Notes

The 2011 register has been reformatted into a Carter Corporation Photographic register format.
This audit was based upon conducting a re-inspection of the items listed within the Carter Corporation Annual update of 2010.

ORIGINAL REGISTER INSPECTION NOTES -

The original register inspection noted the following:

The update dated April 1998 was the only documentation provided for the preparation of the 2005 update. The 2005 update was not prepared with reference to the original register dated January 1995 by Asset Services.

Note sample analysis results or the extents of installed items are not recorded in the 1998 update. Recommend that over time the asbestos register is backed up by sample analysis for register items, potentially with a view to eliminating or verifying items. Recommend that the client acquire a copy of the original Asset Services register (1995)

Carters
Asbestos Management

REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

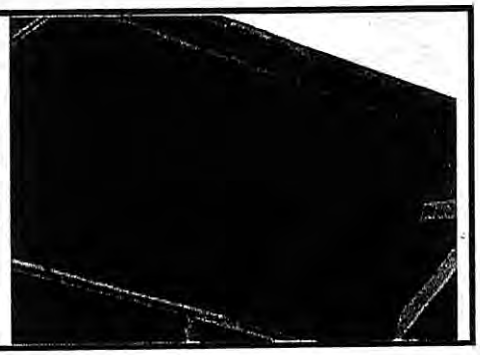
DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
A. Building external eaves lining (facing north east, level 3) – fibre cement sheet set on a 45 degree angle.	Approx 24m² Limited access	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

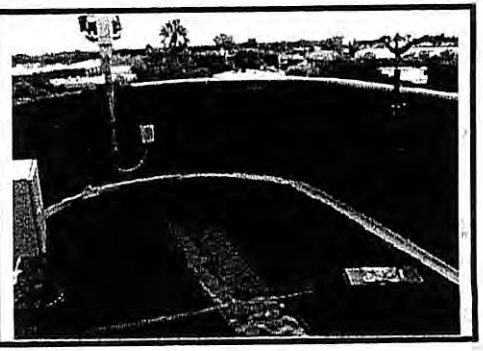
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Good Sealed Non friable	Sample 01/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Note the tower containing the A/C duct appeared to have a new rubber membrane coating to the tower surface. The presence of asbestos membrane at this tower could not be verified.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B1. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Poor Unsealed Non friable	Sample 01/GS/270412.	Not required

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

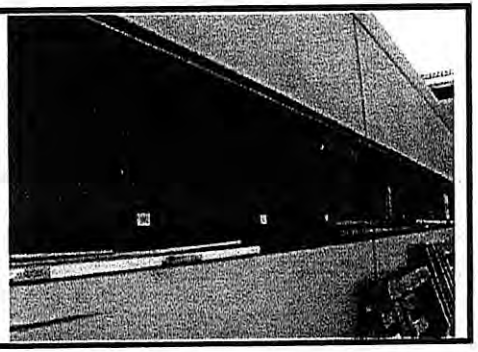
High Risk P2 – Restrict access. Dust residue and debris visible on roof from high traffic use. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Asbestos Approved Code of Practice". Recommend implement a safe access system to prevent further abrasion damage to the surface



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
C. Building external window panels to level 1 store room. Access the lane through the plant room level one to see external surfaces – fibre cement sheet.	Approx 15 No. panels approx. 8 m² visible Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

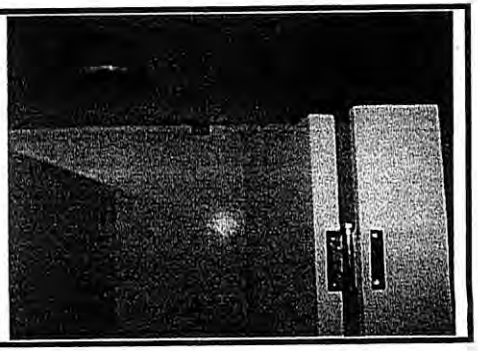
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x3) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
1. Building internal level 3 male / female toilets – partition walls, fibre cement sheet.	Approx 12^{m2} Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

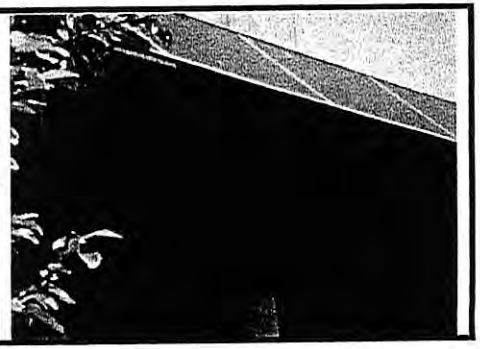
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
1a. Building internal level 3 above lobby on angled section continuation of item A. Eaves lining fibre cement sheet set on a 45 degree angle.	Approx 15m Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

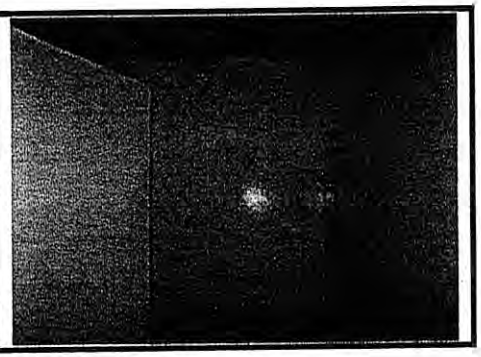
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
2. Building internal level 3 male / female toilets divider wall and duct cover in ladies toilet. Extent to include a small section of sheeting installed in ceiling above the male WC, with a hole cut out.	Approx 7m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

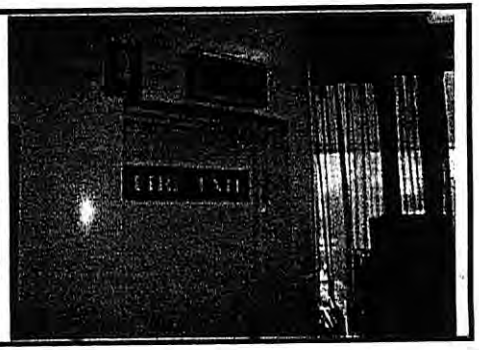
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
4. Building internal level 3 fire doors, internal core – compressed fibre insulation. Fire doors on this floor appear to be to the stair wells and a small cleaner's cupboard door in ladies toilet.	3 No. Approx 2m^2 Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

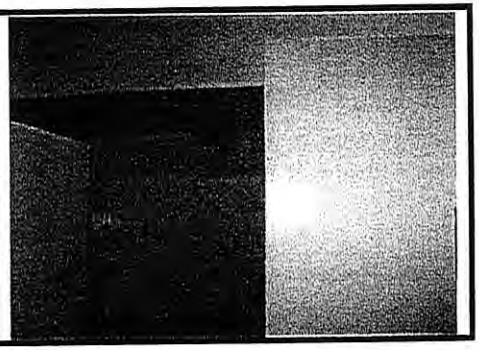
Low Risk P4 – Treat all fire doors as having an asbestos internal core unless confirmed otherwise by sample analysis.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
5. Building internal level 2 male / female toilets – partition walls, fibre cement sheet.	Approx 12m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

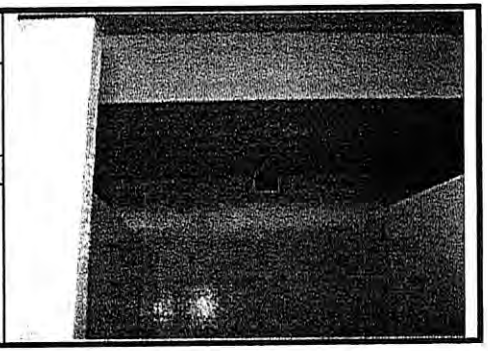
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
6. Building internal level 2 male / female toilets divider wall and duct cover in ladies toilet. Extent to include a small section of sheeting installed in ceiling above the male WC, with a hole cut out.	Approx 7m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

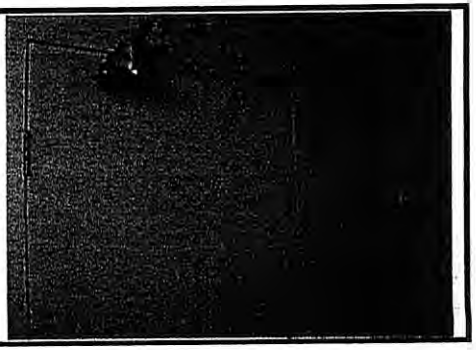
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
7. Building internal level 2 fire doors, internal core – compressed fibre insulation. Fire doors on this floor appear to be to the stair wells and a small cleaner's cupboard door in ladies toilet.	3 No. Approx 2m^2 Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

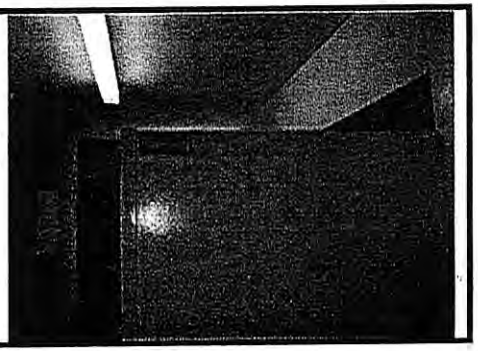
Low Risk P4 – Treat all fire doors as having an asbestos internal core unless confirmed otherwise by sample analysis.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
8. Building internal level 1 male / female toilets – partition walls, fibre cement sheet.	Approx 12m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

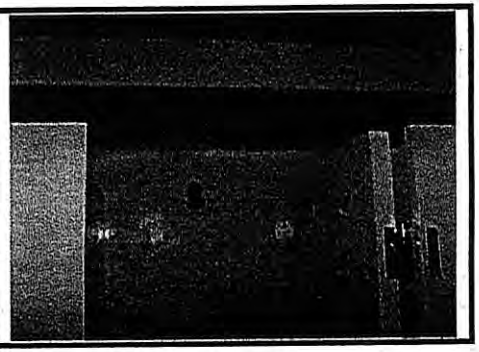
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
9. Building internal level 1 male / female toilets divider wall and duct cover in ladies toilet. Extent to include a small section of sheeting installed in ceiling above the male WC, with a hole cut out.	Approx 7m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

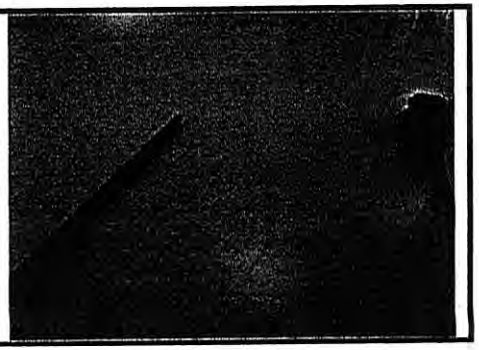
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
10. Building internal level 1 floor covering all areas – vinyl tiles (cream brown with mustard coloured stripes).	Approx 120m^2 visible	Presume asbestos content	Stable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

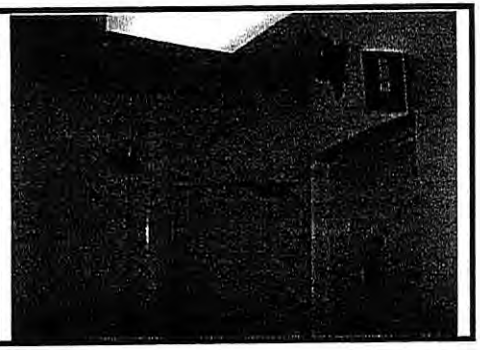
Low Risk P4 –Advised by staff; tiles may be concealed below carpeted and new vinyl sheet areas. Access these areas with caution when maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
May 2008. - Area east of lifts not accessed.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
11. Building internal level 1 fire doors, internal core – compressed fibre insulation. Fire doors on this floor appear to be to the stair wells and a small cleaner's cupboard door in ladies toilet.	12 No. Approx 2m^2 Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

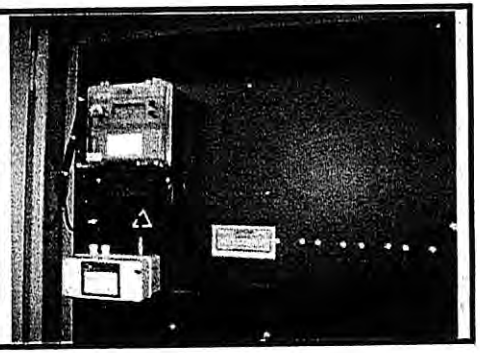
Low Risk P4 – Treat all fire doors as having an asbestos internal core unless confirmed otherwise by sample analysis.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
12. Building internal level 1 emergency generator room electrical board – black resin board.	Approx 0.8m² Accessible	Chrysotile asbestos (typical)	Good Unsealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

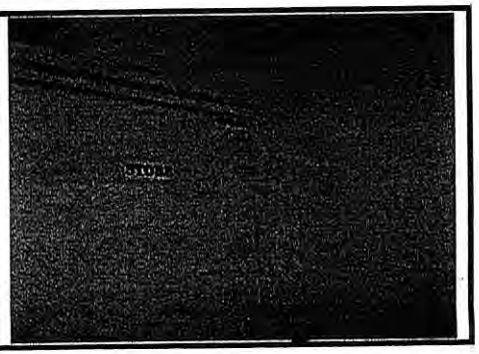
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
May 2010. - Dust residue and debris visible in base of electrical cabinet. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Approved Code of Practice".



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
13. Building internal level 1 panel above fire doors – fibre cement sheet	3 No. Approx 1m² Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

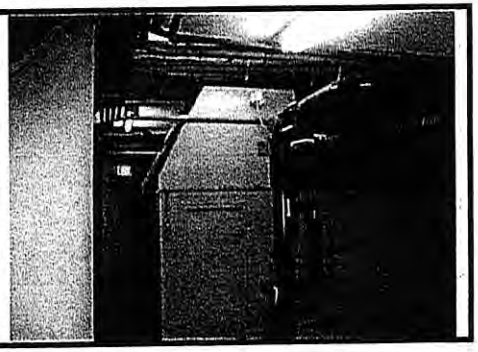
Low Risk P4 – Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Total access to the roof area was not gained, as safe access was not available. This asbestos product is inherently hard and brittle. Treat all asbestos roof areas as fragile. Access with caution. Use safe access systems.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
14. Building internal level 1 plant room, Level 1, mastic on air conditioning duct joints.	Not quantified Inaccessible	Presume asbestos content	Building internal level 1	Visual	Not visible Covered by general sign on a/c plant.

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

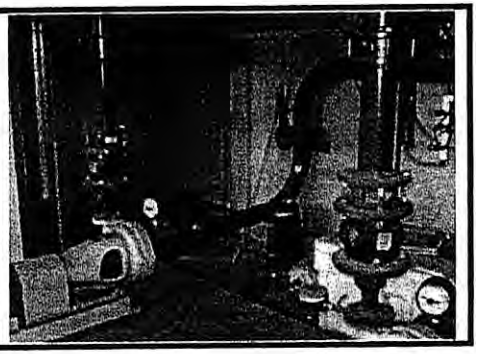
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
15. Building internal level 1 plant room, Level 1, insulated pipe jackets above two centrifugal pumps, number 1 and number 2.	Not quantified Inaccessible	Presume asbestos content	Building internal level 1	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
17. Building internal level 1 telephone cable riser fire retardant sealer.	Not quantified Inaccessible	No asbestos detected	Not assessed	Sample 03/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

No asbestos detected upon laboratory analysis of sample.

No Photograph

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
18. Sludge and debris washed down vents in toilets from roof damage.	Not quantified Inaccessible	No asbestos detected	Not assessed	Sample 02/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

No asbestos detected upon laboratory analysis of sample.

No Photograph

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL ID	SIGNAGE STATUS	
[illegible]	[illegible]	[illegible]				No Photograph
SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS						
New low visible [illegible]						

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL ID	SIGNAGE STATUS	
[illegible]	[illegible]	[illegible]				No Photograph
SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS						
No asbestos [illegible]						

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL ID	SIGNAGE STATUS	
[illegible]						No Photograph
SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS						
No asbestos visible [illegible]						

Appendix B – CERTIFICATES OF ANALYSIS

Samples submitted for laboratory analysis are analysed in accordance with NATA approved methods for analysis. Certificates of analysis are provided by the laboratory as a reference of the results for inclusion into the register.

Samples as received in our offices (taken by others) are analysed in accordance with NATA approved methods for analysis, No responsibility is taken for the actual sampling collection technique, determination of sample location, and the consequent bearing on the sample result.

- **Limitations of Sample Analysis**

The certificate of analysis provided by the laboratory is a record of asbestos or non-asbestos content of the sample piece provided for analysis.

Generally sample size is approximately 30mm square for a non-friable material where the material is accessible to sample. Consideration is given to minimise damage to clients property where taking necessary samples as it is difficult to remove a sample from installed materials such as flushed fixed panel wall, ceiling linings and fixed floor coverings. In other cases it may not be safe to access materials to take samples such as electrical panels, and integral gasket / seal or insulation materials to plant and equipment.

- **Inconclusive Sample Identification**

In some instances it is not possible to determine asbestos fibre content within a sample using the NATA approved method (PLM – polarized light microscopy). Items such as vinyl floor products, adhesives and mastics due to low asbestos content and/or non uniform asbestos fibre concentration are often difficult to analyse. Due to the nature of these materials the NATA laboratory has recommended that the material be tested using another independent technique (XRD – x-ray diffraction), where PLM and XRD analysis have been made two certificates of analysis will be supplied.
XRD can determine what group of minerals are present in the sample i.e. Serpentine and or Amphibole however the test does not specify what type of asbestos fibre is present. The result may show a sample for example from the Amphibole group but this does not confirm the mineral is actually an asbestos fibre; however the material is presumed to contain asbestos and will be treated as asbestos.

- **Representative Sample Analysis**

Asbestos content can vary within a material dependant upon factors such as installation procedures, differences in stocks and supplies, time differences in stages of construction and physical mixing of varying quantities of asbestos with other materials. Sections of asbestos containing materials may have also been replaced with non-asbestos materials that look identical from inspection (eg damaged eaves or wall cladding patched or repaired with non-asbestos). Inconsistencies in sample results may be possible due to the inspected materials within a property not being typical throughout. Carter Corporation accepts no responsibilities for the representativeness of the sample(s) presented for analysis.

ABN: 83 117 421 324
OCTIEF Pty Limited
1a/22 Ereton Drive, Arundel QLD 4214
Enquiries: 1300 138 366
Ph: (07) 5537 2536
Fax: (07) 5537 2535
corporate@octief.com.au
www.octief.com.au

Issue Date: 03/05/2012 **Job #:** BSQ111476.1

Certificate of Analysis
Laboratory Report

Client:	Carter Corporation	**Sampled By:**	GS
Client Contact:	Andrea Reeve	**# of Samples Submitted:**	3
Telephone:	(08) 8346 2999	**Sampling Date:**	27/04/2012
Email:	areeve@cartercorporation.com.au	**Date Received:**	01/05/2012
Project:	AS1979 E4570	**Identification Date:**	02/05/2012

Scope: Microscope examination for the presence of asbestos

Methodology: Samples are examined in accordance with the methodology outlined in the Australian Standards (AS4964-2004) and In-House Procedure QP-930-001

NATA Approved Identifier: Tim Trembath ..... **Report Approved By:** Jay Spencer .....

This report supersedes report BSQ111476.0

Acronyms

Asbestos Fibre Types

CH	*Chrysotile (White Asbestos) fibres detected*
A	*Amosite (Brown / Grey Asbestos) fibres detected*
C	*Crocidolite (Blue Asbestos) fibres detected*
-	*No asbestos fibres detected*

Non-Asbestos Fibre Types

ORG	*Organic fibres detected*
SMF	*Synthetic mineral fibres detected*
UMF	*Unidentified mineral fibres detected*
-	*No non-asbestos fibres detected*

SCOPE OF ACCREDITATION: Class 7.82.31: Qualitative identification of asbestos types in bulk samples by polarised light microscopy

This document is issued in accordance with NATA's accreditation requirements
Accredited for compliance with ISO/IEC 17025
NATA accreditation number: 15172
This document may not be reproduced except in full

Carters
Asbestos Management
ADDRESS: 25 College Road, Kent Town SA
REGISTER: AS 1970
DATE: 27/04/2012
NEXT AUDIT DUE: 04/2013

ABN: 83 117 421 324
OCTIEF Pty Limited
1a/22 Ereton Drive, Arundel QLD 4214
Enquiries: 1300 138 366
Ph: (07) 5537 2536
Fax: (07) 5537 2535
corporate@octief.com.au
www.octief.com.au

Carters
Asbestos Management

REGISTER: AS 1970
ADDRESS: 25 College Road, Kent Town SA
DATE: 27/04/2012
NEXT AUDIT DUE: 04/2013

Issue Date: 03/05/2012

Job #: BSQ111476.1

Table 1 - Results of sample examination using polarised light microscopy (PLM) including dispersion staining

Sample Identification Number	Sample Location	Sample Description	Approximate Size or Weight	Asbestos Detected (Yes/No)	Asbestos Fibre Types Detected	Non-Asbestos Fibre Types Detected
01/GS/270412	North tower - Item B - Membrane and debris	Black bituminous material	40 x 32 x 4mm	Yes	CH	ORG
02/GS/270412	Debris washed down vent level 3 toilets	Sludge	44 x 29 x 3mm	No	-	ORG
03/GS/270412	Sealer from cable risers level 2 and 1	Beige coloured sealer	85 x 64 x 28mm	No	-	-

Detection Notes
N/A

SCOPE OF ACCREDITATION: Class 7.82.31: Qualitative identification of asbestos types in bulk samples by polarized light microscopy

NATA
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Appendix C – REGISTER DRAWING

LEGEND: **This drawing is indicative only, not to scale and is to be read in conjunction with register.**

X = designates ceiling access point

(A.) = letters indicate location of external asbestos containing materials, refer to asbestos register location schedule

(1.) = no.'s indicate location of internal asbestos containing materials, refer to asbestos register location schedule

Carters
Asbestos Management

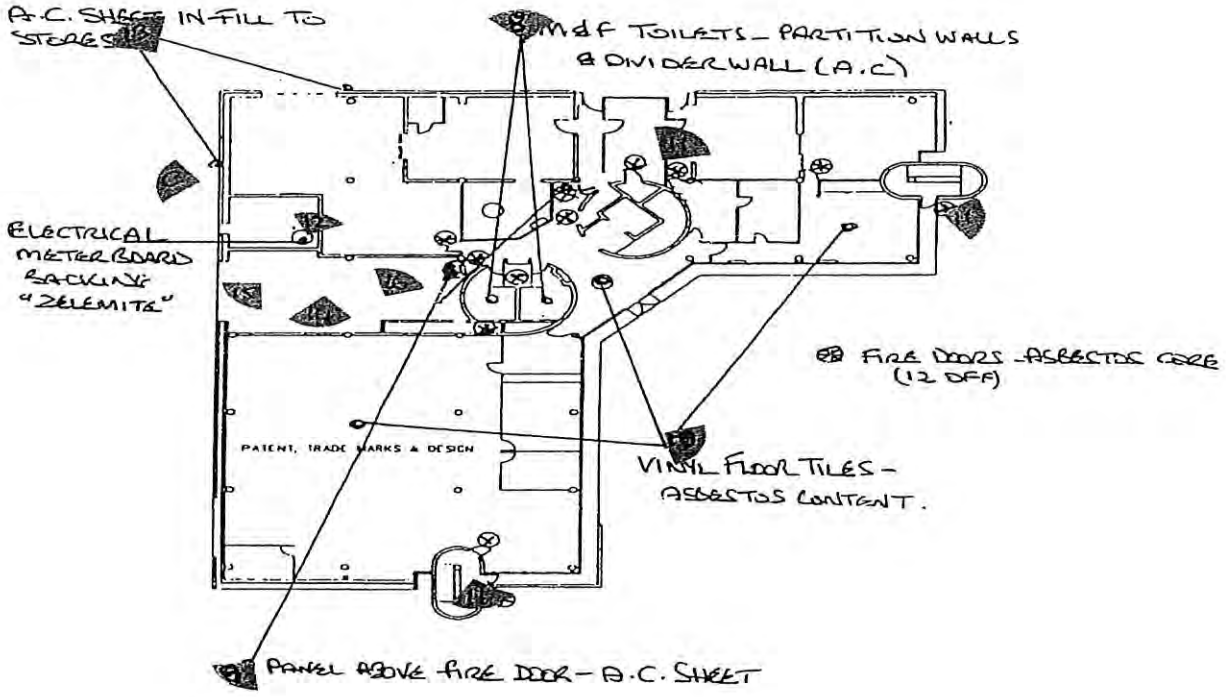
REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

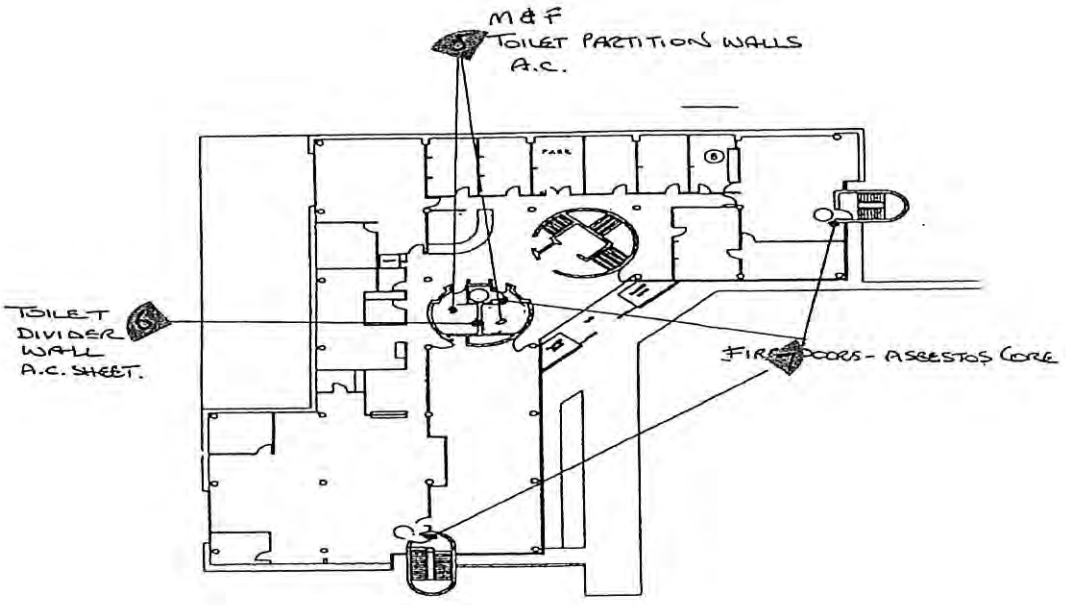
DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

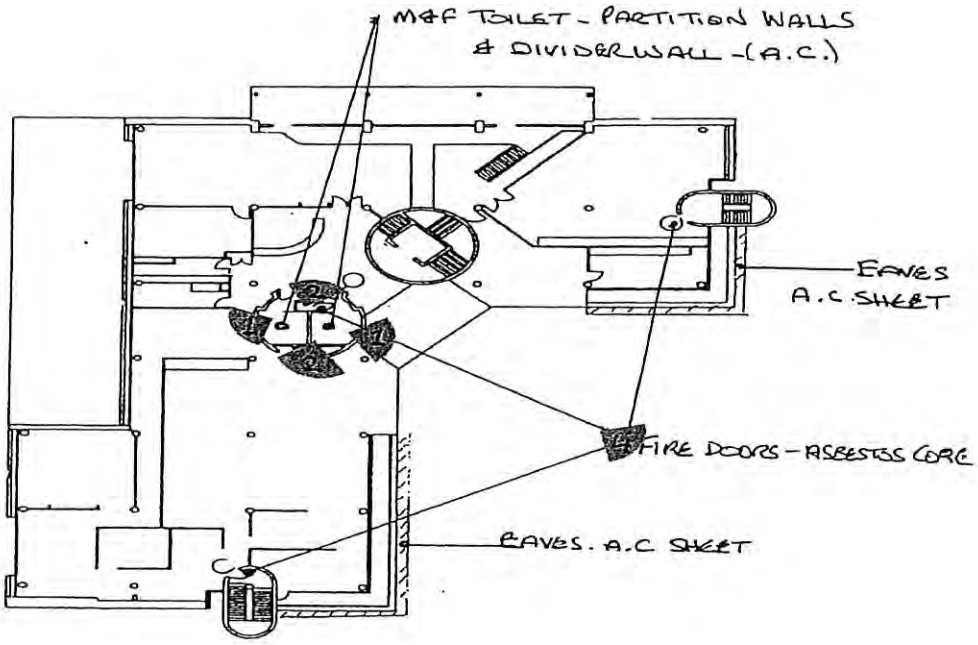
LEVEL 1



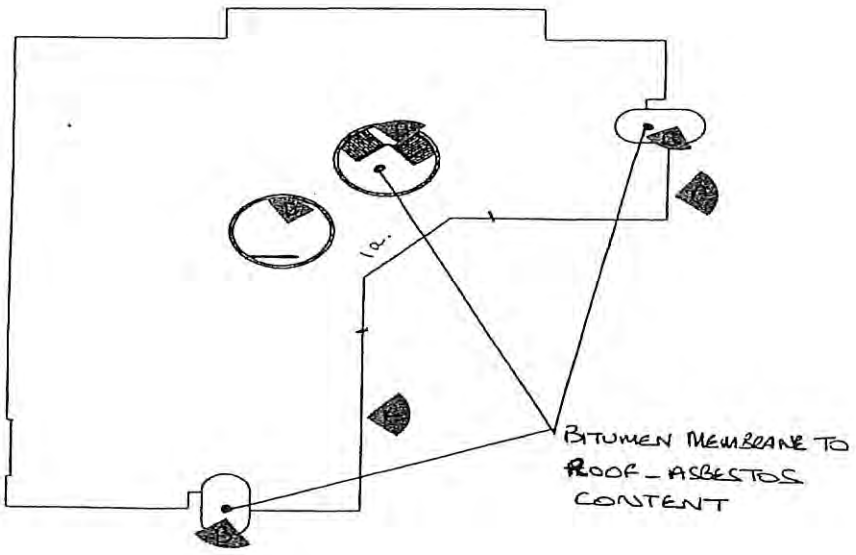
LEVEL 2



LEVEL 3



LEVEL 4



Appendix D – FORMS

Carters
Asbestos Management

REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

1. RECORD OF REMOVALS, MAINTENANCE AND OTHER ASBESTOS RELATED WORKS

Date;	**Government Approval No.;**	
Description of Work; including register item number, location and type of asbestos		
Contractor;	**Supervisor;**	
Managing Consultant;	**Air Monitoring Consultant;**	
Accidental Exposure	**No** ☐ **Yes** ☐	RECORD OF SUSPECTED EXPOSURE TO RESPIRABLE ASBESTOS FIBRES FORM TO BE COMPLETED IF YES
Supporting Documentation Supplied		
☐ **SWMS**	☐ **Government Approval**	☐ **Air monitoring Report** ☐ **Certificate of Inspection**

Date;	**Government Approval No.;**	
Description of Work; including register item number, location and type of asbestos		
Contractor;	**Supervisor;**	
Managing Consultant;	**Air Monitoring Consultant;**	
Accidental Exposure	**No** ☐ **Yes** ☐	RECORD OF SUSPECTED EXPOSURE TO RESPIRABLE ASBESTOS FIBRES FORM TO BE COMPLETED IF YES
Supporting Documentation Supplied		
☐ **SWMS**	☐ **Government Approval**	☐ **Air monitoring Report** ☐ **Certificate of Inspection**

2. RECORD OF SUSPECTED EXPOSURE TO RESPIRABLE ASBESTOS FIBRES

A copy of this form must be given to the employee and the original kept in their personal file for 40 years.

- **Employee to Complete:**

Personal Details

Name: _____ Date of Birth: ----------

Address: _____ Department: ----------

Job Title: _____

I believe I may have been exposed to respirable asbestos fibres, the details being as follows:

Name of Address/Establishment where suspected exposure occurred:

Name: _____

Address: _____

Time:

Date (s) of suspected exposure;
Time (s) / duration of suspected exposure;

Location of suspected asbestos:

Asbestos Register No. AS
Precise Location:
Specify Use, if known:
Asbestos Accidentally Damaged/Disturbed by you:
Type of work that damaged asbestos:
Equipment being used:

Signature of Employee: _____

- **Supervisor to Complete:**

Follow-up action required: _____

_____

_____

_____

_____

_____

Name of supervisor: _____

Signature of supervisor: _____

Adelaide Asbestos Audits and Monitoring

AIRBORNE ASBESTOS FIBRE MONITORING

Site: Bureau of Meteorology 25 College Road Kent Town

Client: Carter Corporation **Date:** 12-12-2012

Job Name: CART01-121212-MS **Approval:** n/a **LRN:** 12-000353

Location	Activity	Time On	Run Time	Flow Rate (ml/min)	Fibres Conc. (per mL)
Northern tower stairwell	G	0822	135	3000	<0.01
Northern tower roof	G	0822	135	3000	<0.01

G = Background C= Clearance F = Final Clearance B= Waste Removal
S = Plastic Stripdown

The Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Source D Update) 2003 [NOHSC:1003(1995)] requires a Fibre Concentration of no more then 0.1 fibres per mL

Analyst: Mark Seater

49 Heath Street Birkenhead 5015
Tel: 040 040 1972 Fax: +61 8 8242 4969

Procedure: AAAM - 01

Carters
Asbestos Management

REGISTER: AS 1978

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
A. Building external eaves lining (facing north east, level 3) – fibre cement sheet set on a 45 degree angle.	Approx 24m^2 Limited access	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

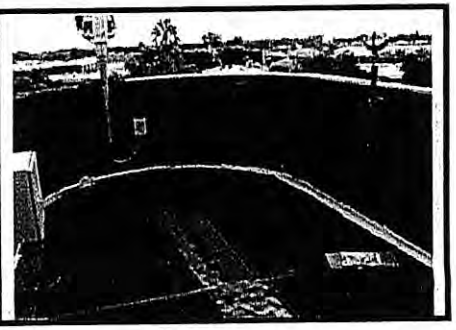
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Good Sealed Non friable	Sample 01/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

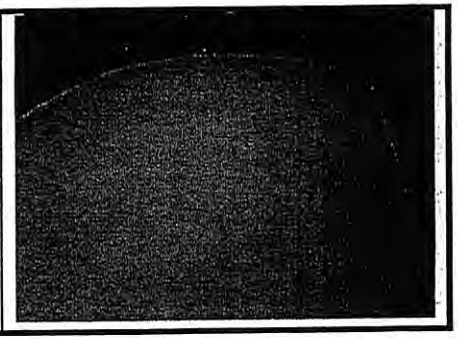
Low Risk P4 –Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Note the tower containing the A/C duct appeared to have a new rubber membrane coating to the tower surface. The presence of asbestos membrane at this tower could not be verified.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B1. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Poor Unsealed Non friable	Sample 01/GS/270412.	Not required

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

December 2012 – Asbestos Maintenance Works completed on the North Tower where access had been restricted per management plan adopted from April 2012 update. North tower has been made safe / vacuumed dust / debris and wet wiped floor area under monitored conditions, before applying a paint base coat to seal the membrane floor area only. Refer to certificate of completion form and air-monitoring clearance report 13/12/12, emailed to building owner for inclusion into the register.
April 2012 - High Risk P2 Restrict access. Dust residue and debris visible on roof from high traffic use. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Asbestos Approved Code of Practice". Recommend implement a safe access system to prevent further abrasion damage to the surface.



Asbestos Audit update after new tower removal work

Carters
Asbestos Management

- **Asbestos Registers & Annual Updates**
- **Asbestos Repairs & Maintenance**
- **Asbestos Training & Support**
- **Asbestos Removal**
- **Asbestos Advice & Consultancy**
- Asbestos Safety Products

CERTIFICATE OF COMPLETION (MAINTENANCE)

DATE OF WORK	12/12/2012	REGISTER or JOB No.:	1979	ENQUIRY No.:	12219
PERSONS CARRYING OUT WORK	Willie Harris				
PROPERTY ADDRESS	Bureau of Meteorology, 25 College Road, Kent Town				
NAME OF CLIENT AUTHORIZING WORK TO PROCEED	Mr John Squarcini				

Work Carried Out *(Brief Scope)*

North tower make safe – vacuum, scrub / wet wipe surface of asbestos containing bituminous membrane floor covering of the under air monitored conditions.
Once all clear given, paint seal bituminous floor covering (base coat) 12/12/2012.
Apply second / final paint coat 13/12/2012

TICK	ITEM NO'S	DESCRIPTION OF WORK
☐		Item removed in accordance with "Approved Code of Practice".
☒	B	Dust and debris cleaned up using approved asbestos rated vacuum system in accordance with "Approved Code of Practice".
☐		Asbestos waste collected and disposed of in accordance with EPA requirements.
☒	B	Item made safe in accordance with "Approved Code of Practice".
☒	B	"All Clear" air monitoring certificate attached (where applicable).
☐		Caution signs installed in accordance with safe work method and SOP.
☐		Samples taken in accordance with safe work method and SOP.
☐		Other (SPECIFY)

Standard Operating Procedure Used / Safe Work Method

- ☐ SOP 3.2 **Removal of Asbestos Cement and Resin Boards**
- ☐ SOP 3.3 **Removal of Vinyl Tiles**
- ☒ SOP 3.5 **Vacuum Use**
- ☒ SOP 3.6 **Making Safe Asbestos Containing Materials**
- ☐ SOP 3.7 **Transport and Disposal of Waste**
- ☐ SOP 3.8 **Collection of Waste**
- ☐ SOP 3.9 **Installing Caution Signs**
- ☐ SOP 3.10 **Installing Register Holder**
- ☐ SOP 1.3 **Sample Taking**
- ☐ OTHER

Job Notes / Qualifications / Limitations of Removal *(if any - Use back of sheet for further notes if required)*

Signed : WGH **Date:** 13-12-2012

Carter Corporation Pty Ltd 42 Trembath Street Bowden SA 5007
P (08) 8346 2999 F (08) 8346 3888 E enquiries@cartercorporation.com.au W www.cartercorporation.com.au
ABN 58 007 881 763 Asbestos Lic 72803 EPA Lic 13933 AS4801 OH&S Accredited

Adelaide Asbestos Audits & Monitoring

REPORT OF ANALYSIS

Report Number:	**RN 01644**	**Client Order Number:**	AS1979e12219WH
Reference Code:	CART01-121212-MS	**Approval Number:**	n/a

Air monitoring in accordance with the National Occupational Health and Safety Commission guidance note on the membrane filter method for estimating airborne asbestos dust was carried out concluding on the **12-Dec-12**

at **Bureau of Meteorology 25 College Road Kent Town**

on behalf of **Carter Corporation**

The spreadsheets of results attached, indicate that during the monitoring sessions the areas tested were well below the Worksafe Australia Exposure Standard of 0.1 fibres /mL.

This report should not be considered as a contractual document and should not be reproduced except in full.

Mark Seater
Approved Analyst
12-Dec-12

Adelaide Asbestos Audits Monitoring
49 Heath Street, Birkenhead SA 5015
Mobile: 040 040 1972 Fax 08 8242 4969
E-mail: adelaideasbestos@bigpond.com.au

Adelaide Asbestos Audits and Monitoring

AIRBORNE ASBESTOS FIBRE MONITORING

Site: Bureau of Meteorology 25 College Road Kent Town

Client: Carter Corporation **Date:** 12-12-2012

Job Name: CART01-121212-MS **Approval:** n/a **LRN:** 12-000353

Location	Activity	Time On	Run Time	Flow Rate (ml/min)	Fibres Conc. (per mL)
Northern tower stairwell	G	0822	135	3000	<0.01
Northern tower roof	G	0822	135	3000	<0.01

G = Background C= Clearance F = Final Clearance B= Waste Removal
S = Plastic Stripdown

The Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Source D Update) 2003 [NOHSC:1003(1995)] requires a Fibre Concentration of no more then 0.1 fibres per mL

Analyst: Mark Seater

49 Heath Street Birkenhead 5015
Tel: 040 040 1972 Fax: +61 8 8242 4969

Procedure: AAAM - 01

MOTT MACDONALD

Environmental Soil and Groundwater Assessment

25 College Road, Kent Town, South Australia

4 October 2016

25 CKT Pty Ltd

22 King William Street
Adelaide SA 5000
PO Box 3400, Rundle Mall,
SA 5000
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T +61 (0)8 7325 7325
F +61 (0)8 8221 7007
mottmac.com

Environmental Soil and Groundwater Assessment

25 College Road, Kent Town, South Australia

4 October 2016

25 CKT Pty Ltd

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	23/9/2016	RL	ACM	ACM	Draft for client review
B	04/10/16	RL	ACM	ACM	Final

Information class: Standard

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Contents

List of Acronyms 1

1 Introduction 2

1.1 Background 2
1.2 Proposed development 3
1.3 Aim 6
1.4 Objectives 6
1.5 Approach 6
1.5.1 Guidelines 6
1.5.2 Specific influences 6
1.5.3 Sampling rationale 6
1.5.4 Work conducted 7

2 Regulatory and Assessment Framework 8

2.1 Site contamination 8
2.2 Norwood Payneham and St Peters (City) Development Plan (Consolidated – 2 July 2015) 8
2.3 Environment Protection Act, 1993 8
2.4 Assessment guidelines 9
2.4.1 National Environment Protection Measure 9
2.4.2 ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality 10
2.5 Data quality objectives 11

3 Site Information 15

3.1 Site walkover and photographs 15
3.2 Regional geology and hydrogeology 18
3.3 Previous report 18

4 Preliminary Conceptual Site Model 20

4.1 Purpose 20
4.2 Preliminary Conceptual Site Model 20
4.2.1 Potential source of contamination at the site 20
4.2.2 Presence of a sensitive receptor at the exposure point 20
4.2.3 Exposure route by which a receptor can intercept the contamination and

transport mechanism by which the contamination can travel 21
4.3 Summary 21

5 Soil Assessment 22
5.1 Rationale 22
5.2 Methodology 22
5.3 Chemical analysis 24
5.4 Guidelines 24
5.5 Results 25
5.5.1 Soil observations 25
5.5.2 PID results 25
5.5.3 Laboratory results 25
5.5.4 Quality assurance/quality control 26

6 Groundwater Assessment 31
6.1 Rationale 31
6.2 Methodology 31
6.2.1 General 31
6.3 Groundwater chemical analysis 34
6.4 Environmental values 34
6.5 Guideline specifications 35
6.6 Results 36
6.6.1 Drilling observations 36
6.6.2 Field results 36
6.6.3 Groundwater flow direction 36
Laboratory results 36
6.6.4 Quality assurance/quality control (QA/QC) 37
6.7 Beneficial use assessment 40

7 Conceptual Site Model and Assessment of Risk 42
7.1 Overview of updated Conceptual Site Model 42
7.2 Risk analysis 42

8 Discussion 44

9 References 45

10 Limitations 46

Appendices 49

A. DEWNR groundwater data 50

B. Groundwater well installation permits 51

C. Groundwater field parameters 52

D. Calibration certificates 53

E. Soil logs and groundwater well construction details 54

F. Chain of custody documentation and certificates of analysis 55

G. EIL spreadsheet outputs 56

H. Result summary tables 60

I. Honesty in reporting form 61

J. Previous site history assessment report 62

List of Acronyms

Acronym	Definition
BTEX	Benzene, toluene, ethylbenzene, xylenes
CSM	Conceptual Site Model
DEWNR	Department for Environment, Water and Natural Resources, Government of South Australia
DQO	Data quality objectives
EP Act	*Environment Protection Act 1993*, Government of South Australia
EPA	Environment Protection Authority, Government of South Australia
EPP	Environment Protection (Water Quality) Policy 2015
EIL	Ecological investigation level
HIL	Health investigation level
HSL	Health screening level for vapour intrusion
mBGL	Metres below ground level
mBTOC	Metres below top of casing
NEPC	National Environment Protection Council
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended in 2013)
OCPs	Organochlorine pesticides
OPPs	Organophosphate pesticides
PAH	Polycyclic aromatic hydrocarbons
PCA	Potentially contaminating activity
PSI	Preliminary Site Investigation
SA	South Australia
TRH	Total recoverable hydrocarbons
UST	Underground fuel storage tank
VOC	Volatile Organic Compound

1 Introduction

1.1 Background

Mott MacDonald Australia Pty Ltd (Mott MacDonald) was commissioned by 25 CKT Pty Ltd to conduct a preliminary environmental soil and groundwater assessment for the land defined by 25 College Road, Kent Town, South Australia (CT 6130/16).

This assessment is based on Mott MacDonald's understanding of its client requirements, including timing and expense considerations provided by 25 CKT Pty Ltd. These requirements, along with the assessment parameters, are reflected in the client authorized proposal (dated 6 July 2016), and other client correspondence.

The site is situated in the City of Norwood Payneham and St Peters local government area. The site context is provided in Figure 1.1, and an aerial photograph showing the site is provided in Figure 1.2.

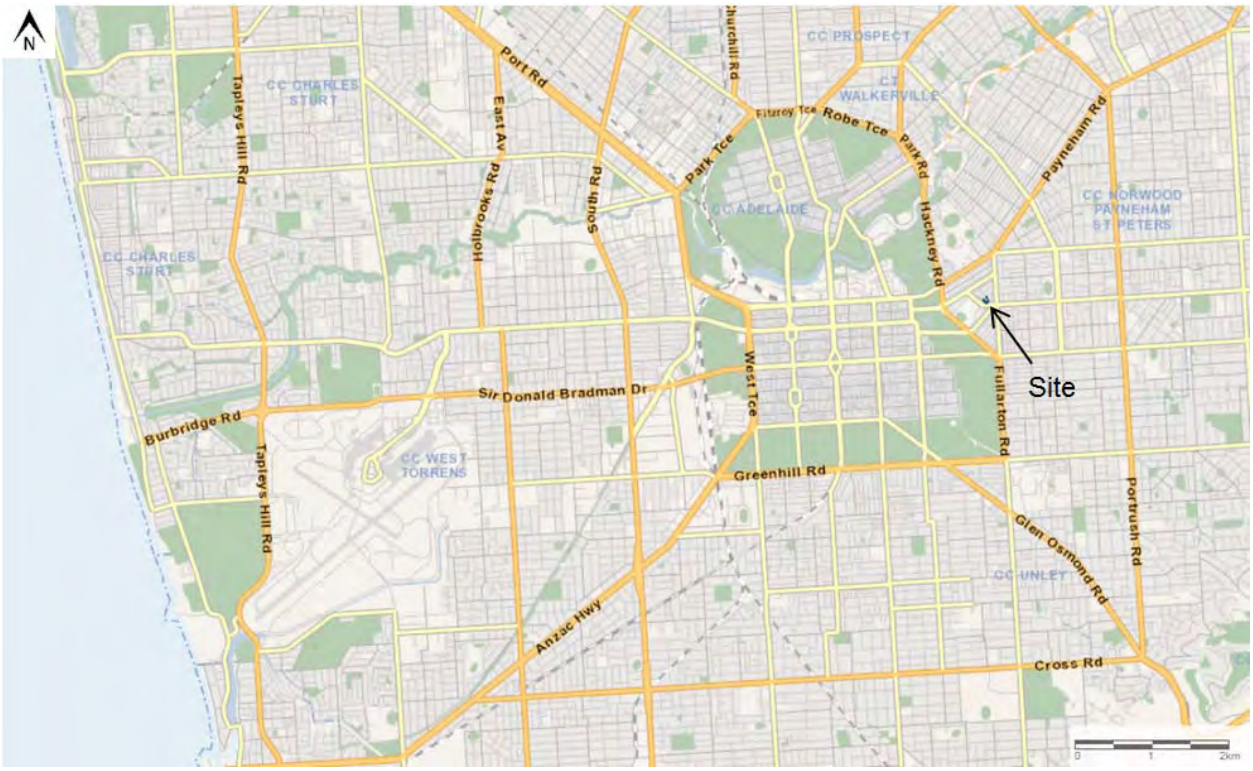


Figure 1.1: Aerial photograph showing site location and context (source: http://maps.sa.gov.au/plb/, 2016)



Figure 1.2: Aerial photograph showing the approximate site boundary and surrounding land use (source: http://maps.sa.gov.au/plb/, 2016)

1.2 Proposed development

We understand the nature of the proposed development to be elevated multi-storey residential apartments. The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark on the first level. Groundwater is not proposed for abstraction at the site.

All garden beds on level 1 would be on a podium level and comprise planter boxes which would not be in contact with the ground surface. The only areas unsealed from the original site would be the areas associated with the townhouses on Little Young Street, the front yards of the townhouses on College Road (potentially) and a small garden bed strip along Little Young Street to soften the appearance of the car park. There would therefore be limited opportunity for access to subsurface soils once developed. The site would not be used for primary food production. It is also understood that services would be surrounded with 500mm of imported fill meeting SA EPA Waste Fill Guidelines.

The proposed ground and first level floor plans are shown in Figure 1.3 and Figure 1.4 respectively.

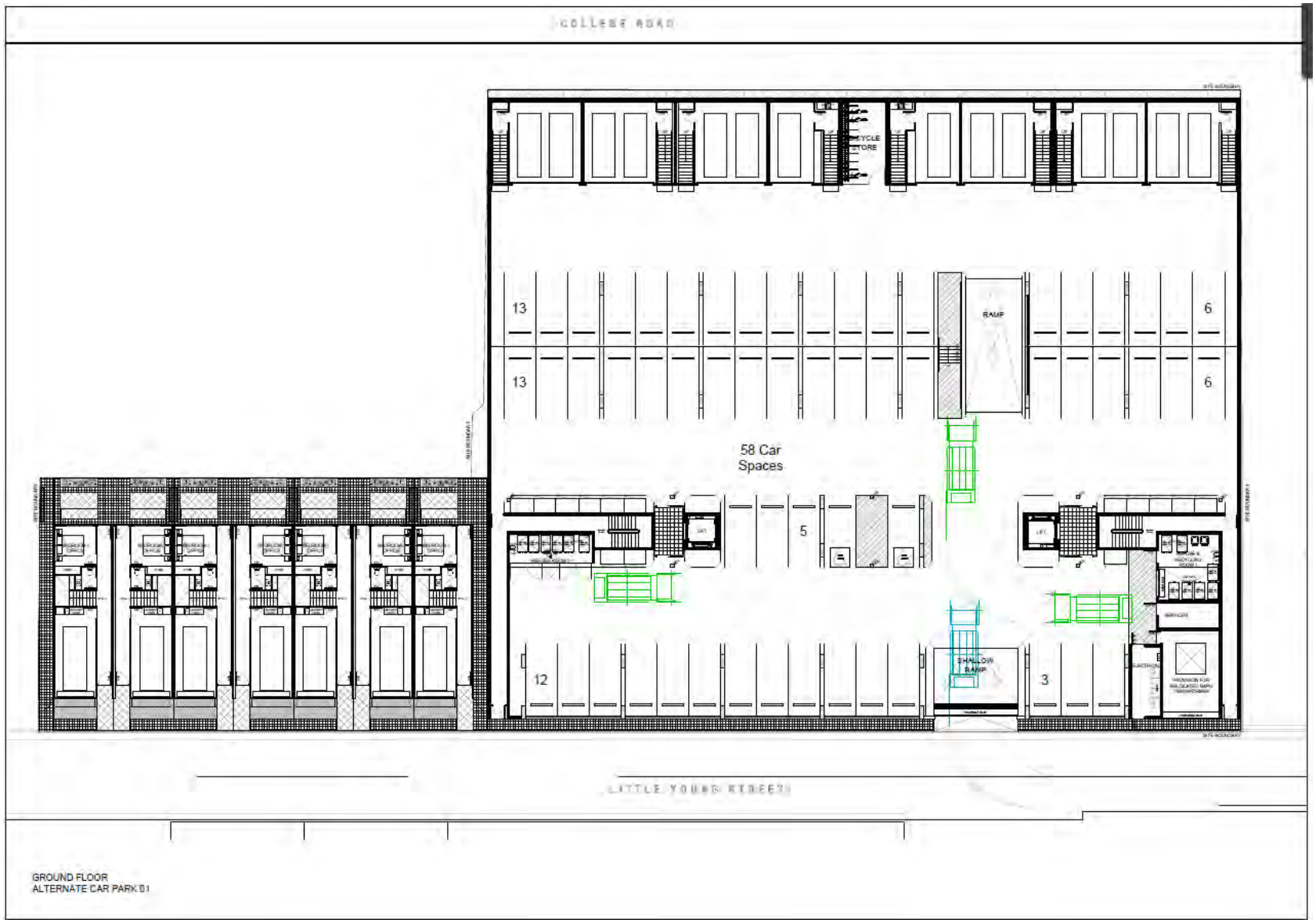


Figure 1.3: Proposed ground floor plan (provided by SCOPE Development Solutions on 8 August 2016).

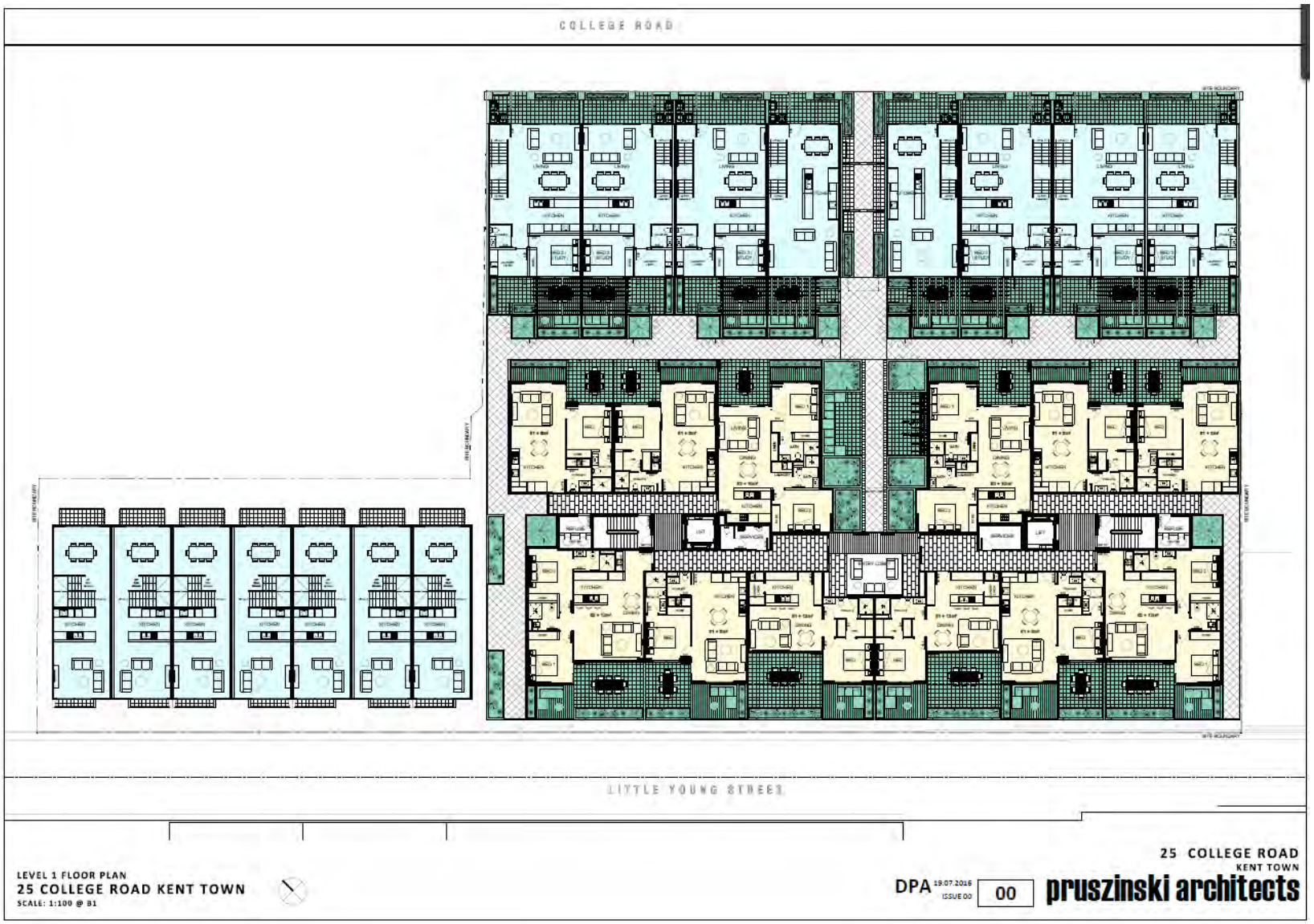


Figure 1.4: Proposed Level 1 floor plan (provided by SCOPE Development Solutions on 8 August 2016).

1.3 Aim

The aim of the work was to assess the potential for gross or widespread soil contamination to exist as a result of current or previous land uses at the site and whether there are issues likely to present potential liabilities or constraints on the potential future residential redevelopment

1.4 Objectives

Data would be obtained from multiple lines of evidence in order to:

- relate known historical information to potential for soil, soil vapour or groundwater contamination to be present at the site
- extract chemical information from the results of soil and groundwater testing and compare this with recognised guidelines in order to consider the potential for environmental or human health impacts from the perspective of a screening level assessment
- establish the interrelationship between previous land use, reported site conditions and potential exposure pathways in the context of the nature of the proposed land use
- establish from a risk perspective for the proposed land use the potential magnitude and the presence or otherwise of reported gross or widespread contamination
- recommend (where necessary) supplementary assessment, remediation and/or management conditions for the future redevelopment of the site.

1.5 Approach

1.5.1 Guidelines

The approach adopted is in general accordance with the ANZECC/NHMRC (1992) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*, the ASC *National Environment Protection (Assessment of Site Contamination) Measure* (December 1999 as amended in 2013) and the Standards Australia *Guide to the investigation and sampling of sites with potentially contaminated soil* (AS 4482.1-2005).

1.5.2 Specific influences

The assessment approach is based on Mott MacDonald's general understanding of client requirements and was conducted within budget and timing constraints.

Mott MacDonald prepared a report titled '*Preliminary Environmental Site History Assessment_25 College Road, Kent Town, South Australia*' (dated 29 April 2016) for the site, which listed chemicals that are indicative of the potential historical and current land uses of the site. This was used to guide the soil and groundwater chemical analysis.

Access was not possible to all site areas as the site was still operational at the time of assessment.

1.5.3 Sampling rationale

Mott MacDonald developed an assessment to meet the project objectives in a consistent manner across the site, based on AS4482.1-2005 as a minimum. AS4482.1-2005 provides a recommendation for the distribution of investigation locations across sites of various sizes and has broad industry acceptance. A multiple-lines-of-evidence approach was also adopted.

In consideration of the project objectives, Mott MacDonald proposed the assessment strategy detailed in Table 1.1, which was derived with reference to the specific scope requirements already noted.

Table 1.1: Sampling rationale

Objective	Approach	Application
Assessment of shallow soils across the site	In recognition of the potential for broad and localised contamination of shallow soils (likely to comprise a high proportion of fill), an investigation density generally consistent with the minimum sampling density set out in AS4482.1-2005 was adopted.	This approach was applied to the assessment of shallow soils across the site.
Characterisation of deep (natural) soils, including at the soil/water interface	Rather than intensive sampling and analysis of this body of soil which would be cost prohibitive, the assessment of natural soil was based on: A moderate frequency of sampling of the upper natural soils (below a nominal depth of influence from overlying fill materials); A limited sampling program within the deeper natural soils; and Field observations and field screening of those soil cores extending through the vertical soil profile.	This approach was applied to the assessment of deep natural soils and soils at the soil water interface.
Assessment of inferred downgradient groundwater	Assessment of two groundwater wells in accessible areas at locations inferred to be hydraulically down gradient of the site, in order to capture potentially elevated chemical concentrations that might be present in the site groundwater and at the soil/water interface.	Well installation on the south and western boundaries of the site

1.5.4 Work conducted

The site assessment included the following:

- Consideration of the following site contamination assessment (included in Appendix J):
  - Mott MacDonald (dated 26 April 2016). '*Preliminary Environmental Site History Assessment_1-9 Norma Street, Mile End, South Australia*'.

- Assessment of soils at the site, comprising:
  - Drilling and retrieval of soil samples at fifteen locations on 25 and 26 August 2016 with a Simco drilling rig using push tube techniques within the site boundary
  - Screening of soil samples in the field using a Photo Ionisation Detector (PID) to assess the presence of volatile organic compounds
  - Logging of the materials encountered
  - Chemical analysis of selected soil samples for key chemicals of interest
  - Implementation of a QA/QC program
  - Data interpretation and reporting.

- Assessment of groundwater at the site, comprising:
  - Drilling and installation of two groundwater wells
  - Logging of the materials encountered
  - Screening of soil samples during well drilling using a PID to assess the presence of volatile organic compounds
  - Groundwater gauging using a LNAPL/DNAPL/water interface probe
  - Development and sampling of groundwater well following groundwater parameter measurements
  - Chemical analysis of groundwater samples for select chemicals of interest
  - Implementation of a QA/QC program
  - Data interpretation and reporting.

2 Regulatory and Assessment Framework

2.1 Site contamination

Soil contamination has the potential to impact adversely on human health and the environment; however in order for a significant or identifiable risk to be present, there must be an exposure pathway. The exposure pathway comprises the following:

- Source – The presence of a substance that may cause harm.
- Receptor – The presence of a receptor which might be harmed at an exposure point.
- Pathway – The existence of a means or mechanism of exposing a receptor to the source.

In the absence of a plausible exposure pathway there can be minimal risk. Therefore, the presence of 'something measureable' i.e. concentrations of a chemical or presence of asbestos does not necessarily imply that there is measurable human harm. It is necessary to have a significant source of contamination, an appropriate or effective pathway for this to be presented to a receptor, and the receptor must have a negative response to this exposure.

Hence, the nature and importance of sources, receptors and exposure routes will vary with every site, situation, intended end use and environmental setting.

It should also be noted that management measures to address any aspect of the above can reduce the significance of any risks.

2.2 Norwood Payneham and St Peters (City) Development Plan (Consolidated – 2 July 2015)

The Norwood Payneham and St Peters (City) Development Plan (Consolidated – 2 July 2015) contains the following provisions in relation to contaminated sites:

Objectives:

Objective 52: Appropriate assessment and remediation of site contamination to ensure land is suitable from the proposed use and provides a safe and healthy living and working environment.

Objective 53: Protection of human health and the environment wherever site contamination has been identified or suspected to have occurred.

Site Contamination:

172 Development, including land division, should not take place where site contamination has occurred unless the site has been assessed and remediated as necessary to ensure that it is suitable and safe for the proposed use.

2.3 Environment Protection Act, 1993

In South Australia, the assessment, management and remediation of site contamination is regulated by the *Environment Protection Act 1993* (EP Act). The EP Act defines site contamination in section 5B as follows:

> *(1) For the purposes of this Act, site contamination exists at a site if—*
>
> > *(a) chemical substances are present on or below the surface of the site in concentrations above the background concentrations (if any); and*

(b) the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere; and

(c) the presence of the chemical substances in those concentrations has resulted in—

(i) actual or potential harm to the health or safety of human beings that is not trivial, taking into account current or proposed land uses; or

(ii) actual or potential harm to water that is not trivial; or

(iii) other actual or potential environmental harm that is not trivial, taking into account current or proposed land uses.

(2) For the purposes of this Act, environmental harm is caused by the presence of chemical substances—

(a) whether the harm is a direct or indirect result of the presence of the chemical substances; and

(b) whether the harm results from the presence of the chemical substances alone or the combined effects of the presence of the chemical substances and other factors.

(3) For the purposes of this Act, site contamination does not exist at a site if circumstances of a kind prescribed by regulation apply to the site.

Based on the above, the first stage in determining whether or not site contamination exists is to assess whether chemical substances have been added to the site through an activity and whether these substances are above background concentrations. The second stage is to assess whether the chemical substances have resulted in actual or potential harm to the health or safety of human beings or the environment that is not trivial.

The professional assessment of site contamination and consequential risk to human health and the environment is guided by the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM), Australian Standards and several guidelines prepared the EPA. The NEPM operates as an environment protection policy under the EP Act.

If site contamination is determined to be present at a site, the EP Act provides mechanisms to assign responsibility for the contamination and appropriate assessment and/or remediation of the contamination.

2.4 Assessment guidelines

The scope of works and methodology adopted for the assessment were generally based on the guidance provided in the following documents:

- ANZECC/NHMR.C (1992). Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites.
- NEPC (1999), National Environment Protection (Assessment of Site Contamination) Measure, December 1999 (ASC NEPM) as amended in 2013
- Standards Australia. Guide to the investigation and sampling of sites with potentially contaminated soil – AS 4482.1-2005.
- ANZECC (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality
- Environment Protection (Water Quality) Policy 2015 Water quality criteria (Schedule 2)

2.4.1 National Environment Protection Measure

The NEPM provides a nationally consistent framework for assessing the presence and significance of site contamination in soil and groundwater. The NEPM methodology is based on assessing the potential for an unacceptable risk to human health or the environment by comparing concentrations of chemical

substances to conservative, generic investigation levels for various environmental settings and land use scenarios.

Investigation levels are defined in the NEPM as 'concentrations of a contaminant above which further appropriate investigation and evaluation will be required'. They are not clean up or response levels. A response level is defined as 'the concentration of a contaminant at a specific site based on a site assessment for which some form of response is required to provide an adequate margin of safety to protect public health and/or the environment'.

The NEPM health investigation levels (HILs) are based on conservative assumptions around providing protection to a young child living or playing on the site and subjected to exposure to contaminated soils. The most stringent HILs are assigned to sensitive land uses such as residential, child care centres and primary schools. Where the land use provides for reduced access to soils, or reduced time in the setting for a child (e.g. high density residential apartments or an industrial site), higher HILs are set in the NEPM. In the event that an investigation level is exceeded at a site, the nature of the appropriate response is typically determined by site-specific environmental or human health risk assessment. NEPM HIL A (residential with garden/accessible soil) is considered to be appropriate for this site.

NEPM ecological investigation levels (EILs) are provided for Arsenic, Copper, Chromium III, DDT, naphthalene, Nickel, Lead and Zinc in soil for the protection of terrestrial ecosystems. These are based on a species sensitivity distribution model developed for Australian conditions, and have been developed for areas of ecological significance, urban residential areas/public open space and commercial and industrial uses. The protection levels are dependent on these landuse settings, with areas of ecological significance having the most protection. NEPM aged EILs for urban residential areas/public open space are considered to be appropriate for the assessment. Refer to Appendix G for EIL calculation input and output spreadsheet extracts.

The NEPM ecological screening level (ESLs) are concentrations above which further appropriate investigation and evaluation would be required. ESLs broadly apply to coarse- and fine-grained soils and various land uses and are generally applicable to the top 2 m of soil. The NEPM ESLs for (urban residential & public open space) are used in this assessment.

The NEPM also provides Health Screening Levels for Vapour Intrusion (HSLs). These are investigation levels for soil and soil vapour in the assessment of site contamination. These guidelines consider concentrations in soil and take into consideration soil types, depths of contaminant concentrations in the soil profile, the depth to groundwater and the nature of the overlying soils. The conservative HSL-A (Low Density Residential) and HSL-B (High Density Residential) guidelines are used in this assessment.

NEPM management limits (residential, parkland & public open space – fine and coarse) were used to assess the presence of petroleum hydrocarbons.

2.4.2 ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality

The Australian National Water Quality Management Strategy presents trigger values for chemicals that may be found in fresh and marine waters. These are the concentrations of the key performance indicators measured for the ecosystem, below which there exists a low risk that adverse biological (ecological) effects will occur. They indicate a risk of impact if exceeded and should 'trigger' some action, either further ecosystem specific investigations or implementation of management/remedial actions. The following ANZECC (2000) trigger values are used in this assessment, based on the EPP (2015) and the measured groundwater total dissolved solid concentration:

- Livestock drinking water trigger value (low risk)
- Agricultural irrigation water long term use trigger values
- Aquaculture and human consumption of aquatic foods (freshwater production)

2.5 Data quality objectives

The data quality objective (DQO) process is a seven-step iterative planning approach that is used to define the type, quantity and quality of data needed to inform decisions relating to the environmental condition of a site. A summary of the process is provided in Table 2.1.

Table 2.1: Data quality objectives

Step	Requirement	Comment
1	State the problem	The site owner requires information to understand whether widespread or gross soil or groundwater contamination is present at the site. The assessment aims to use multiple lines of evidence in order to screen for gross or widespread issues which present a potential liability and/or require management.
2	Identify the decision/goal of the study	Previous work has provided an overview of the site history of the site. Information is now required in relation to shallow and deeper soils across the site and more detailed information is needed about the nature/status of groundwater at accessible locations which are considered to represent the most logical point of screening for the presence of the chemicals of interest in the groundwater. If soils or groundwater are demonstrated to be exceeding the adopted guidelines, then further consideration of the specific medium would be considered. The goals of the field investigation and sampling programs were to obtain screening level information on the potential for widespread or gross distribution of chemicals in soils and groundwater across the site.
3	Identify the information inputs	Information required to support decisions and recommendations includes details on the media e.g. fill/natural soil; field observations and measurements (e.g. PID, groundwater field parameters) and chemical concentrations from soil and groundwater samples to be assessed against the adopted guidelines. The inputs required to address the study goals are also outlined in this report and include: • Previous site data • Proposed land uses and development boundaries • Appropriate guideline documents • Appropriately experienced environmental staff • Geological data and information relevant to subsurface structures • Hydrogeological data • Concentrations of chemicals of concern in soil and groundwater • Observations regarding the presence of building materials or other waste materials, including materials potentially containing ash • Observations of separate phase liquids, odours and discolouration of the soil, groundwater and surface water media • Distribution of identified onsite contamination both laterally and vertically • Consideration of potential transport mechanisms • Consideration of potential exposure pathways • Quality assurance and quality control (QA/QC) data.
4	Define the boundaries of the study	The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decision(s). The matters to consider at this stage include: • the geographical extent of the proposed investigation, as provided in Figure 1.2. • temporal boundaries (there are no obvious ongoing requirements) • the land use boundaries of the site to be assessed per the NEPM land use guidelines (conservative residential guidelines are to be initially adopted uniformly across the site due to the preliminary nature of the proposed development plan) • the lateral and vertical intervals in which contamination distribution is encountered
5	Develop the analytical approach	The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1-4 into a single statement that gives a logical basis for choosing between alternative actions. If the PID reading is greater than 10ppm, then further consideration of soil sampling for volatile organic compounds/organics would be conducted. During groundwater sampling, the field parameters would be measured until there is less than a 10% variation between the measurements. Acceptable limits adopted in the assessment are defined in Table 2.2.
6	Specify performance or acceptance criteria	Relevant performance and/or acceptance criteria were determined for quality assurance/quality control purposes and comparison of soil and groundwater analytical results to appropriate assessment criteria. The method to address the acceptable limits on decision errors has been based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness. The tolerable limits on decision errors for data include: Probability that 95% of data satisfied the DQIs, therefore the limit on the decision error that a conclusive statement may be incorrect is 5%. In applying statistical analysis of a data set:

Step	Requirement	Comment
		• No individual sample reports a concentration that exceeded 250% of site assessment criteria • A normal distribution was only used if the coefficient of variance was not greater than 1.2 • The standard deviation of a sample population did not exceed 50% of the site assessment criteria • A robust quality assurance and quality control (QA/QC) program was implemented • Appropriate sampling and analytical density for the purposes of the investigations and representative sampling was undertaken. • The project DQIs have been established to set acceptance limits on field and laboratory data collected for this investigation. Laboratory procedure acceptance limits are set at different levels for different laboratories. Non-compliances with acceptance limits are to be documented and discussed.
7	Develop the plan for obtaining data	The seventh step involves identifying the most resource-effective sampling and analysis design for generating the data that is required to satisfy the DQOs. The collection of data was optimised by the development of an appropriate sampling and analytical strategy and included: • The division of work into distinct sections for consideration • The consideration of the most suitable sampling and assessment methods and options • The selection of site assessment guidelines based on the site context and the optimisation of the site redevelopment at the time of assessment.

Table 2.2: Acceptable limits

DQI	Field	Laboratory	Acceptability Limits
Completeness	- All critical locations sampled - All samples collected (from grid and depth) - Standard Operating Procedures (SOPs) appropriate and complied with - Experienced sampler - Documentation correct	- All critical samples analysed and all analytes analysed according to SOPs - Appropriate methods - Appropriate practical quantitation limits (PQL) - Sample documentation complete - Sample holding times complied with	As per NEPC (1999) < nominated criteria As per NEPC (1999)
Comparability	- Sample SOPs used on each occasion - Experienced sampler - Site climatic conditions - Same types of samples collected - Use of the same kinds of instruments	- Same analytical methods used (including clean-up) - Sample PQL (justify/quantify if different) - Same laboratories (NATA accredited) - Same units	As per NEPC (1999) < nominated criteria
Representativeness	- Appropriate media sampled according to SOP - All relevant media sampled -The analytical suite targets the contaminants of concern	- All samples analysed according to SOP	
Precision	- SOPs appropriate and complied with - Collection of blind and split duplicate samples	- Analysis of: Blind duplicate samples (1 in 10 samples) Split duplicate samples (1 in 20 samples) Laboratory duplicate samples Laboratory prepared trip blank (1 sampling round)	 RPD of 30 to 50% RPD of 30 to 50% RPD of 30 to 50% Non-detect for COC
Accuracy	- SOPs appropriate and complied with - Collection of rinsate blanks - Field trip blanks	- Analysis of: Matrix spikes acceptability ranges Matrix spike duplicates	 Typically 70 to 130% RPD of <30%

DQI	Field	Laboratory	Acceptability Limits
	- Field rinsates	Surrogate spikes	70 to 130%
	- Method blanks	Laboratory control samples	70 to 130%
		Laboratory prepared spikes	70 to 130%

3 Site Information

3.1 Site walkover and photographs

A site visit was conducted on 26 August 2016 by a Mott MacDonald representative. The site is approximately 3,370m^2 in plan area. Access to the site building is from street level off College Road and Little Young Street. However, the ground level of the site is approximately 2.5m below street/ground level. It appears that the site has been cut away in the past and retaining walls front College Road and the site to the south.

The site is occupied by a large multi-storey building across approximately two thirds of the site. A bitumen carpark is located in the north-western portion of the site. A loading bay is located in the southern portion and a garden is located in the northern portion.

Site walkover photographs are shown in Photos 3.1-3.10.

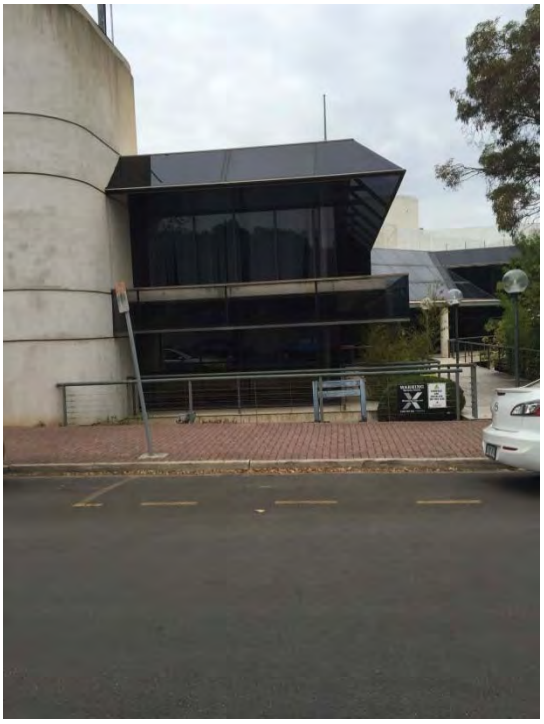


Photo 3.1: Photograph of outside of site taken from College Road looking west



Photo 3.2: Photograph of rear of site showing southern portion of site

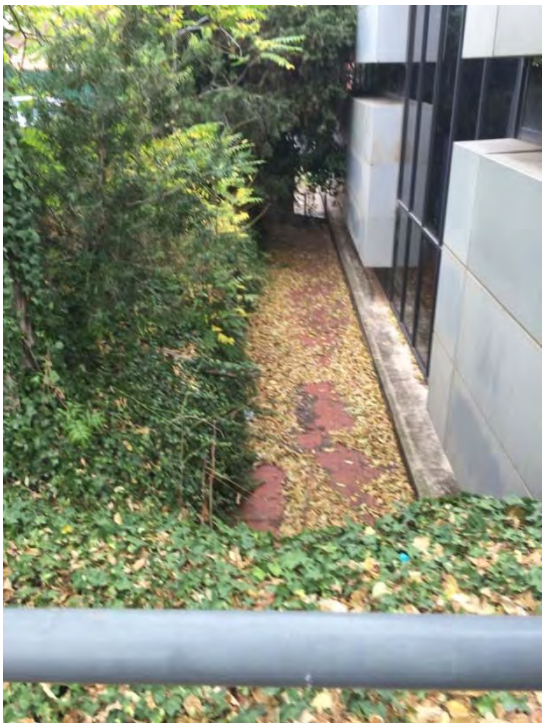


Photo 3.3: Photograph of southern boundary of site



Photo 3.4: Photograph of southern face of site building



Photo 3.5: Photograph of central ground level site courtyard

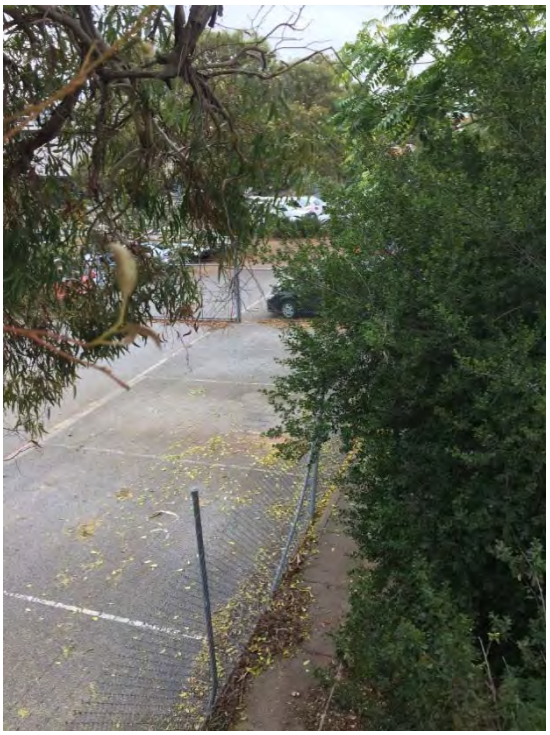


Photo 3.6: Photograph of site carpark facing west



Photo 3.7: Photograph of inside of site building

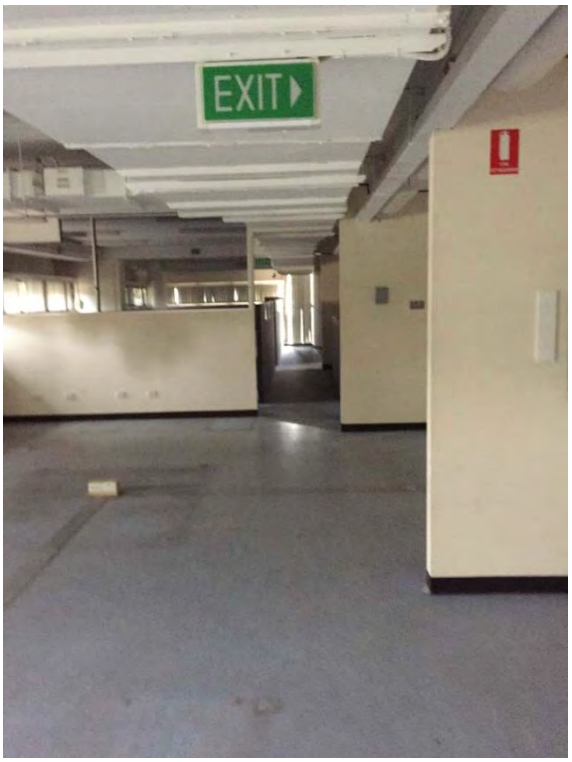


Photo 3.8: Photograph of inside of site building



Photo 3.9: Photograph of inside of site building



Photo 3.10: Photograph of inside of site building

3.2 Regional geology and hydrogeology

A summary of the regional geology and hydrogeology is presented in Table 3.1.

Table 3.1: Regional geology and hydrogeology

Source	Detail
Soil	
South Australia 1: 250 000 Scanned Geological Maps Published and Unpublished. Department for Manufacturing, Innovation, Trade, Resources and Energy. Version 2008:2.	Pooraka Formation. Pale red-brown sandy clay containing carbonate of the LOVEDAY SOIL. Gravel lenses near ranges. Small outcrops of older calcrete and veneers of younger sand and soil are not differentiated.
Hydrogeology	
Department of Environment, Water and Natural Resources Groundwater Database (refer to Appendix A)	The DEWNR groundwater database indicates that there are 14 groundwater wells within 0.4km of the site, including some of which that are in the inferred down gradient groundwater flow direction (west of the site). The recorded average total dissolved solid concentration of the wells is 1,091mg/L, with a maximum of 1,499mg/L and a minimum of 350mg/L. The purposes are recorded as OBS (1), TWS (1), INV (5), MON (1). No groundwater wells are recorded as occurring at the site. The recorded standing water levels in the area surrounding the site vary between 4.3-9.25mbgl, with an average of 6.47mbgl. The groundwater data report and plan showing the location of groundwater wells surrounding the site are provided in Appendix A.

The closest major surface waterbody to the site is the River Torrens, located approximately 1.5km north-west of the site. Three ponds in the city parklands are located approximately 875m west of the site. The Gulf St Vincent is located approximately 11.5km west of the site. The regional groundwater is expected to flow in a westerly direction.

3.3 Previous report

Mott MacDonald *(26 April 2016)* prepared a report titled '*Preliminary Environmental Site History Assessment_1-9 Norma Street, Mile End, South Australia'* for the site. The report was prepared for The Trustee for Scope Development Trust and is provided in Appendix J.

Based on the environmental site history research, the chemicals presented in Table 3.2 are indicative of the potential historical and current land uses of the site.

Table 3.2: Summary of potential areas and chemicals of interest[1]

Activity of interest	Chemicals of environmental interest	Medium of interest	Potential significance
Potential fill of unknown origin	Broad analyte screen	Shallow soil	Low
Potential termite treatment	Pesticides, heavy metals	Shallow soil	Low
Motor Wreckers, Earth Moving Equipment Operator	BTEX, PAH, heavy metals, TRH	Soil	Low
Carpenter	Heavy metals from paints, solvents	Soil	Low
Publishing house/Printer	Heavy metals including chromium, solvents, BTEX, PAH, TRH	Soil & groundwater	Medium
Asbestos containing material	Asbestos	Shallow soil	Low if appropriately managed by a qualified asbestos contractor

[1] These chemicals of environmental interest are not a prescriptive list for any further exploratory intrusive assessment that may be conducted, nor a statement of the presence of these chemicals, but rather a list to be given consideration. Analytes to be tested for if further assessment is conducted should be selected based on site specific observations and conditions. In addition, screening level testing may be conducted for analytes which are considered to represent the generally accepted basic suite of chemicals which may then give rise to the need for more detailed or varied analysis.

4 Preliminary Conceptual Site Model

4.1 Purpose

The development of a Conceptual Site Model (CSM) is an essential part of all site assessments and provides the framework for identifying if and how a site may have become contaminated and how potential receptors may be exposed to contamination, either in the present or the future. The complexity of the CSM corresponds to the scale and complexity of the known or potential contamination impacts.

The CSM identifies complete and potential pathways between the known or potential contamination source(s) and receptor(s). Where the pathway between a source and a receptor is incomplete, the exposure to chemical substances via that pathway cannot occur, however the potential for that pathway to be completed (for example, by abstraction of groundwater or a change in land use) should also be considered in the assessment.

4.2 Preliminary Conceptual Site Model

The preliminary CSM below has been developed from Mott MacDonald's understanding of the site setting based on the Site History Assessment (Mott MacDonald, 2016).

4.2.1 Potential source of contamination at the site

The following Table 4.1 shows potential sources of contamination that may be present at the site.

Table 4.1: Potential contamination sources at the site

Activity of interest	Chemicals of environmental interest	Medium of interest	Potential significance
Potential fill of unknown origin	Broad analyte screen	Shallow soil	Low
Potential termite treatment	Pesticides, heavy metals	Shallow soil	Low
Motor Wreckers, Earth Moving Equipment Operator	BTEX, PAH, heavy metals, TRH	Soil	Low
Carpenter	Heavy metals from paints, solvents	Soil	Low
Publishing house/Printer	Heavy metals including chromium, solvents, BTEX, PAH, TRH	Soil & groundwater	Medium
Asbestos containing material	Asbestos	Shallow soil	Low if appropriately managed by a qualified asbestos contractor

4.2.2 Presence of a sensitive receptor at the exposure point

The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark on the first level. The elevated multi-storey residential apartments would have occupiers of variable demographics.

The DEWNR groundwater database indicates that there are 14 groundwater wells within 0.4km of the site, including some of which that are in the inferred down gradient groundwater flow direction (west of the site). The recorded average total dissolved solid concentration of the wells is 1,091mg/L which is potentially suitable for potable use. However, no groundwater wells are recorded as occurring at the site and the surrounding well purposes are recorded as OBS (1), TWS (1), INV (5), MON (1), therefore there are no registered domestic wells at the site and there is a government imposed Temporary Moratorium on well construction for domestic purposes within the Central Adelaide Groundwater Area. Therefore, site impacted groundwater is unlikely to be used by sensitive receptors.

The closest major surface waterbody to the site is the River Torrens, located approximately 1.5km north-west of the site. Three ponds in the city parklands are located approximately 875m west of the site. The Gulf St Vincent is located approximately 11.5km west of the site. These surface water bodies are considered unlikely to be impacted by the site.

4.2.3 Exposure route by which a receptor can intercept the contamination and transport mechanism by which the contamination can travel

The recorded standing water levels in the area surrounding the site vary between 3.6-9.25mbgl. The site contains high plasticity clay soils.

It is understood that services would be surrounded with 500mm of imported fill that meets SA EPA Waste Fill Guidelines.

It is understood that the majority of the site would be covered with concrete (underlain with Forticon or other comparable plastic), which would largely limit these areas as viable exposure pathways. However, the balance of the site would comprise outdoor areas, including landscaped gardens.

Potential transport mechanisms for the site include:

- Human physical contact with onsite soil from any unsealed proposed garden areas and during:
  - construction works; and
  - operational maintenance
- Consumption of produce grown in any in ground garden areas
- Resident and maintenance worker inhalation of vapours from volatile soil contamination (if present)

4.3 Summary

Based on this preliminary CSM, a number of potentially complete exposure pathways exist at the site. Supplementary works therefore need to be undertaken to assess all exposure pathways and potential risks to future site users.

This CSM is refined in Chapter 7 at the end of this report to reflect the changes to Mott MacDonald's understanding of the site resulting from the intrusive assessment described in Chapters 5 and 6.

5 Soil Assessment

5.1 Rationale

Based on the site history research (refer to Section 3.3.1), an intrusive soil assessment was conducted at accessible locations across the site to consider the environmental status of the soil (refer to Table 1.1 for sampling rationale).

5.2 Methodology

Fifteen locations were drilled and sampled on 25 and 26 August 2016. The sampling was conducted by an experienced Mott MacDonald representative. Representative soil samples were collected generally from the top of each soil horizon. The sampling locations are approximately shown in Figure 5.1.

The detailed soil assessment methodology that was followed, including key elements of the quality assurance (QA) program is presented in Table 5.1.

Table 5.1: Soil assessment methodology

Activity	Details
Field procedures	Field procedures were undertaken in general accordance with the NEPM (2013) and AS4482.1-2005.
Soil sampling	Drilling and retrieval of soil samples was undertaken with a simco drilling rig using pushtube techniques within the site boundary. Soil samples were collected by hand with fresh gloves for each soil sample.
Decontamination of equipment	Drilling equipment was decontaminated prior to use using phosphate free detergent Decon 90, followed by rinsing with deionised water. Each pushtube was also cleaned with diluted Decon90 and rinsed with laboratory supplied water between drilling locations. A rinsate sample was obtained from the cleaned pushtube and analysed for select chemicals of interest as a QA check.
Duplicate sampling	Field duplicate soil samples were collected to provide a check on sample variability, laboratory performance and accuracy. Intra-laboratory duplicate samples were retrieved and analysed at the primary laboratory and inter-laboratory duplicate samples were retrieved and analysed at the secondary laboratory.
Laboratories used and NATA accreditation	Eurofins MGT (primary laboratory) and Envirolab (secondary laboratory for QC purposes) are NATA accredited for the analyses undertaken.
Sample preservation and storage	Samples were placed in laboratory supplied containers and stored in chilled eskies. Samples were then freighted directly to the NATA accredited laboratories of Eurofins MGT and Envirolab.
Sample labelling	A unique sample number was used to label and clearly identify each sample.
Soil PID screening	All soil samples were screened in the field for the presence of volatile organic compounds using a PID, which was calibrated using isobutylene gas prior to use. The PID meter calibration certificate was retained (refer to Appendix D).
Sample tracking	Chain of custody documentation was used for the transport of all samples to the laboratory and is included in Appendix F. The chain of custody document was completed listing sample numbers, date of collection and analyses required. This was signed by each person transferring and accepting custody.
EILs	Natural soil sample 'SB7/3_1.0-1.1' was tested for clay content, pH, Fe, TOC and CEC in order to calculate the aged EILs for the site. The results from the laboratory are presented in Appendix F and were converted to the correct units and then inputted into the Ecological investigation levels - Interactive (Excel) Calculation Spreadsheet (available at http://www.scew.gov.au/node). Refer to Appendix G for extracts of the inputs to the EIL Interactive (Excel) Calculation Spreadsheet and the associated outputs.



Figure 5.1: Approximate soil retrieval locations

5.3 Chemical analysis

Primary soil samples were submitted for chemical testing to the NATA accredited analytical laboratory of Eurofins MGT. NATA accredited Envirolab was used as the secondary laboratory to assess inter-laboratory split samples. The sample list and associated analytical testing is presented in the chain of custody documentation included in Appendix F, and is summarised below:

- Heavy metals (18)
- Vic EPA IWRG 621 (TRH/ PAH/ Phenols/ OCP/ PCB/ VOC/ Vinyl Chloride/ Metals (As, Cd, Cr, Cu, Ni, Pb, Hg, Ag, Sn, Mo, Se, Zn)/ Cr6+/ CN/ Total Fluoride/)
- Vic EPA - Short Screen (TRH/ PAH/ Phenols/ OCP/ PCB/ BTEX/ Metals (As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Sn, Zn)/ CN/ Total Fluoride)
- Organochlorine pesticides (OCP)
- Total Recoverable Hydrocarbons (TRH)
- Benzene, Toluene, Ethyl Benzene, Xylenes (BTEX)
- Polycyclic aromatic hydrocarbons (PAH)
- Asbestos
- Volatile Organic Compounds (VOCs)
- pH, Clay, TOC, CEC and Fe (for EIL calculations)
- Leachability

The analytical methods used are described on copies of the analytical laboratory certificates provided in Appendix F.

5.4 Guidelines

The guidelines used for the assessment of the analytical results are presented in Table 5.2.

Table 5.2: Applicable soil assessment guidelines

Criteria	Applicability
NEPM Health investigation levels (HILs)	
NEPM HIL A (Residential)	Concentrations of a contaminant above which further appropriate investigation and evaluation would be required. HILs are generic to all soil types and generally apply to the top 3m of soil. Applied to entire site.
NEPM Ecological investigation levels (EILs)	
NEPM EIL (urban residential areas & public open space) –Aged in high traffic area	Concentrations of contaminants above which further appropriate investigation and evaluation would be required. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2m of soil. A contaminant incorporated in soil for at least two years is considered to be aged for the purpose of EIL derivation. Applied to entire site.
NEPM Petroleum hydrocarbon management limits	
NEPM management limits (residential, parkland & public open space)	Limited to petroleum hydrocarbon compounds. They are maximum values that should remain in a site following evaluation of human health and ecological risks and risks to groundwater resources and apply to all soil depths based on site-specific considerations. These limits are to consider the formation of light non aqueous phase liquids, fire and explosion risks and damage to buried infrastructure. Applied to entire site.
Ecological screening levels (ESLs) for petroleum hydrocarbons	
NEPM ESLs (urban residential & public open space)	Concentrations above which further appropriate investigation and evaluation would be required. ESLs broadly apply to coarse- and fine-grained soils and various land uses. They are generally applicable to the top 2 m of soil. Applied to entire site.
Health screening levels (HSLs) for petroleum hydrocarbons	
HSL A & HSL B (Low-high	Concentrations above which further appropriate investigation and evaluation would be required.

Criteria	Applicability
density residential)	HSLs depend on physicochemical properties of soil, as these affect hydrocarbon vapour movement in soil, and the characteristics of building structures. HSLs apply to different soil types, land uses and depths below surface to >4 m and have a range of limitations. Applied to entire site.

5.5 Results

5.5.1 Soil observations

Detailed field soil logs are provided in Appendix E. Soils encountered were predominately characterised by three layers, yellow to white fill sand directly below sealed surfaces, brown to dark brown fill or reworked natural clayey sands underlain by natural red brown, high plasticity sandy clays. Traces of black staining were noted within fill in borehole locations 'SB03' and 'SB15' at depths ranging between 0.4 – 0.85m bgl. No odours or other staining were noted during the soil sampling.

5.5.2 PID results

A PID was calibrated with isobutylene to broadly detect VOCs. The PID results from the soil samples retrieved were measured at 0 ppm. This indicates that the likelihood of volatile gases being present in the soil at the site is low.

5.5.3 Laboratory results

5.5.3.1 Guideline exceedances

The laboratory results for each of the soil samples analysed for the chemicals of interest were below the adopted criteria, with the exception of the following:

- Fill sample **'SB01/2_0.6-0.7'**:
  - **Lead** (2,000mg/kg) and **zinc** (17,000mg/L) which exceed the NEPM HIL A guidelines of 300mg/kg and 7,400mg/kg respectively; and the NEPM EIL (urban residential areas & public open space) (aged) guidelines of 1,100mg/kg and 1,500mg/kg respectively. Underlying sample 'SB01/3_1.0-1.1' did not contain any heavy metal exceedances.
- Fill sample **'SB15/3_0.3-0.4'**:
  - **Copper** (310mg/kg) which exceeds the NEPM EIL (urban residential areas & public open space) (aged) guideline of 150mg/kg and **lead** (330mg/kg) which exceeds the NEPM HIL A guideline of 300mg/kg. Underlying sample 'SB15/4_0.85-0.95' did not contain any heavy metal exceedances.
  - **Benzo(a)pyrene** (2.2mg/kg)/Benzo(a)pyrene TEQ (medium bound) (3.5mg/kg) which exceed the NEPM ESL (urban residential & public open space) guideline of 0.7mg/kg and the NEPM HIL A guideline of 3mg/kg respectively. Underlying sample 'SB15/4_0.85-0.95' did not contain any PAH exceedances.
- Fill sample '**SB10/1_0.1-0.2':**
  - **Benzo(a)pyrene** (2.5mg/kg)/Benzo(a)pyrene TEQ (medium bound) (3.5mg/kg) which exceeds the NEPM ESL (urban residential & public open space) guideline of 0.7mg/kg and the NEPM HIL A guideline of 3mg/kg respectively. Underlying sample 'SB10/2_1.1-1.2' did not contain any PAH exceedances.

The above shallow exceedances were associated with the fill layer and were vertically delineated. These shallow concentrations would likely be removed from the site during normal site surface stripping for geotechnical purposes during early phase construction works.

5.5.3.2 Results over LOR

Results were recorded over the laboratory reporting limits (LOR) for **Total Recoverable Hydrocarbons** (TRH) in samples **'SB15/3_0.3-0.4'** and **'SB10/1_0.1-0.2'**; however, these concentrations (associated with fill) were below the applicable NEPM guidelines where available. The concentrations were vertically delineated, with samples 'SB15/4_0.85-0.95' and 'SB10/2_1.1-1.2' containing TRH below the laboratory limit of reporting.

Results were recorded over the LOR for **Organochlorine Pesticides** (OCP) in samples **'SB11/1_0.09-0.2'**, **'SB13/2_0.25-0.35'** and **'SB15/3_0.3-0.4'**; however, these concentrations (associated with fill) were well below the applicable NEPM guidelines. The concentrations were vertically delineated, with samples 'SB11/2_0.8-0.9', 'SB13/3_0.4-0.5' and 'SB15/4_0.85-0.95' containing OCP below the laboratory limit of reporting.

Results were recorded over the LOR for **Polycyclic Aromatic Hydrocarbons** (PAH) in samples **'SB13/2_0.25-0.35'**, **'SB15/3_0.3-0.4'** and **'SB10/1_0.1-0.2'**; however, these concentrations (associated with fill) were well below the applicable NEPM guidelines. The concentrations were vertically delineated, with samples 'SB13/3_0.4-0.5', 'SB15/4_0.85-0.95' and 'SB10/2_1.1-1.2' containing PAH below the laboratory limit of reporting.

5.5.3.3 Leachability results

Leachability testing was undertaken on the following samples which contained elevated concentrations:

- Lead in 'SB01/2': 1.4mg/L
- Zinc in 'SB01/2': 220mg/L
- Benzo(a)pyrene in 'SB10/1': <0.001mg/L

These leachability results are below the applicable Intermediate Cover and Low Level Contaminated waste classification leachability criteria.

5.5.3.4 Asbestos results

No asbestos or respirable fibres were detected in tested samples 'SB02/1_0.05-0.2' and 'SB14/2_0.3-0.4'.

The analysis results are detailed in the certified laboratory certificates in Appendix F and a summary of the results is provided in Appendix H.

5.5.4 Quality assurance/quality control

5.5.4.1 Data validation

A summary of the quality assurance/quality control (QA/QC) activities undertaken to ensure integrity of the soil data collected is provided in Table 5.3. The results indicate conformance with the specific QA/QC procedures.

Table 5.3 Data validation

QA/QC requirement	Acceptable?	Comments
Samples collected in accordance with standard operating procedures, incorporating appropriate sections of AS 4482.1 – 2005 and AS 4482.2-1999 for sampling of non-volatile components.	Yes	None
Samples delivered to laboratory with correct preservative.	Yes	None
Samples delivered to laboratory within sample holding times.	Yes	None
All analyses NATA accredited.	Yes	None
Required number of sample duplicates analysed.	Yes	None
Sample duplicates reported RPDs within limits set by AS4482.1.	Yes	RPDs are discussed in Section 5.5.4.2 and are presented in Table 5.4. These RPDs are not considered to have compromised the integrity of the results.
Laboratory limits of reporting (LOR)	Yes	The LORs are presented in the laboratory certificates of analysis (Appendix F). All LORs are suitable for the purposes of this investigation.
Laboratory internal Q	Yes	The results obtained for the primary laboratory internal QC samples were within the acceptable limits of repeatability, with RPD values reported for all internal duplicate pairs within the acceptable range of 30% stipulated by Eurofins MGT with the exception of one duplicate RPD of 200% reported for silver, this one outlier is not considered to affect the interpretation of results. Further to the above, it is noted that apart from the one exceedance, all RPD values are within the acceptable range of 50% stipulated by AS4482.1-2005. The results obtained for the secondary laboratory internal QC samples were within the acceptable limits of repeatability, with RPD values reported for all internal duplicate pairs within the acceptable range specified for that chemical. The recoveries from the laboratory control spike samples were within the specified ranges. The laboratory method blank samples were reported below the reporting limits, indicating a low likelihood of false positive results.
Trip blank	Yes	A trip blank with ID ‘TRIP01_25/8/16’ was used on 25/8/2016 and was analysed by Eurofins MGT for BTEX. The results were less than the LOR.
Rinsate	Yes	Two rinsate samples ‘RIN01_25/8/16’ and ‘RIN02_26/8/16’ were retrieved from the cleaned pushtube and tested by Eurofins MGT for HM(18). The results were each less than the LOR.

5.5.4.2 Duplicate analysis

Field duplicate (blind replicate) soil samples were collected to provide a check on sample variability and laboratory performance and accuracy.

Validation and interpretation of the quality control data was undertaken by calculating the relative percentage differences (RPDs) for the primary sample and duplicate sample concentrations. The RPD value for an analyte was calculated using the formula:

RPD (%) = 100[(x1 – x2)/x] where x1, x2 = duplicate results and x = mean of duplicate results.

According to AS4482.1-2005, typical RPD values for soils range from ±30 to ±50%; an RPD within the range of -50% to 50% is considered to show acceptable agreement and, conversely, data is considered to have poor agreement where an RPD is outside this range.

Table 4.3: Soil intra-laboratory and inter-laboratory QC samples

Date	Primary Sample	Replicate Sample (intra-laboratory)	Replicate Sample (inter-laboratory)	Analytes	Relative Percent Difference	Acceptable for the purposes of this assessment?
25/08/2016	SB01/1_0.05-0.2	QC01	-	Not tested	-	Yes
25/08/2016	SB02/2_0.3-0.4	QC02	-	Not tested	-	-
25/08/2016	SB06/2_0.3-0.4	QC04	-	HM(18)	All within acceptance value of 50%	-
25/08/2016	SB08/1_0.2-0.3	QC05	-	Not tested	-	-
25/08/2016	SB11/1_0.09-0.2	QC06	-	Not tested	-	-
26/08/16	SB15/3_0.3-0.4	-	QC08	HM(18)	RPD not calculable/within acceptance value of 50%, except **Arsenic (80%), Chromium (129%), Copper (115%), Nickel (144%), Tin (130%), Tin (74%)** which are likely to be due to sample heterogeneity within the fill material.	Yes

5.5.4.3 Summary

Based on the results of the evaluation of the QA/QC data for soil, it is considered that:

- The sampling methods and QA/QC for field procedures are considered to be suitable for the purpose of this assessment.
- The rinsate sample results were acceptable for the purpose of this assessment.
- The trip blank results were acceptable for the purpose of this assessment.
- The elevated RPD% concentrations are likely to be due to the heterogeneous fill distribution within the samples and are considered to be acceptable for the purpose of this assessment.
- The field and laboratory quality assurance measures implemented are considered to provide an acceptable level of confidence that the data collected and reported is appropriately complete, comparable and representative.
- The field and laboratory quality control measures implemented are considered to provide an acceptable level of confidence that the data collected and reported is appropriately accurate and precise.

Therefore, it is concluded that the data collected for the soil investigation is considered to be reliable and usable for the assessment of the condition of the site.

6 Groundwater Assessment

6.1 Rationale

An assessment of groundwater at the site was also conducted. The groundwater testing focused on the chemicals of interest, including volatile organic compounds (VOCs) that could potentially impact the site if present. These were considered to be the primary chemicals of concern in groundwater, as groundwater would not be abstracted as part of the proposed development. Two groundwater wells were installed on the hydraulically down gradient boundary of the site (refer also to Section 1.5.3 for further rationale discussion).

6.2 Methodology

6.2.1 General

Two groundwater wells ('GW1' and 'GW2') were drilled and installed by a licenced drilling contractor (InDepth Drilling) on 25-26 August 2016. The adopted methodology was undertaken in accordance with that outlined in Table 6.1 and 6.2.

Table 6.1: Assessment methodology

Activity	Details
Permitting	Two Permits to undertake a water affecting activity (well permit) licences were obtained from DEWNR (refer to Appendix B).
Well construction	The groundwater wells were installed by a licenced driller using solid augering techniques. The groundwater well construction details are provided in the well logs in Appendix E and Table 6.2. The installed well casings were 50mm diameter class 18 PVC. Soil samples were also collected from the soil profiles during the installation of the wells (refer to Chapter 5 for further details).
Well development	Well development of 'GW1' was conducted immediately after well installation and consisted of purging the well dry due to minimal water in the well. Well development of 'GW2' was conducted immediately after well installation and consisted of purging approximately four bore volumes from the well.
Measuring groundwater level	The depth to standing water level from the top of casing was measured using a LNAPL/DNAPL interphase water level probe. The probe was washed in Decon 90 (a phosphate free detergent) prior to use.
Well purging	Prior to sampling 'GW2', approximately 2L was developed from the well using a low flow pump and dedicated tubing. Due to limited water in the well, 'GW1' was grab sampled using a bailer. Field parameters (redox potential, dissolved oxygen, pH, temperature and conductivity) were measured with a calibrated water quality meter until they were within 10% of each other for 'GW2', and one measurement was recorded for 'GW1' (refer to Appendix C). The depth of pump intake was approximately 6m bgl, approximately the middle of the screen and water column. Refer to Appendix C for additional information, including purge time and depth to groundwater information.
Groundwater sampling	The groundwater samples were collected on 5/9/16, approximately 9 days following groundwater well installation and development, using a low flow pump with dedicated tubing at 'GW2' and manual bailing at 'GW1'. Dedicated sampling gloves were used and the samples were placed directly from the tubing/bailer into labelled, laboratory provided bottles. No water samples were field filtered. Samples for dissolved heavy metals analysis were laboratory filtered using a 0.45 micron filter prior to analysis. No evidence of LNAPL or DNAPL or staining, sheen or odour was observed in either groundwater well.
Duplicate sampling	Duplicate samples were collected to provide a check on sample variability, laboratory performance and accuracy. An intra-laboratory duplicate sample was retrieved and analysed at the primary laboratory (Eurofins) and an inter-laboratory duplicate sample was retrieved and analysed at the secondary laboratory (Envirolab).
Sample preservation	Samples were placed in laboratory supplied bottles and stored in chilled eskies. Samples were then freighted directly to the NATA accredited laboratories.
Sample labelling	A unique sample number was used to label and clearly identify each sample.
Chain of custody	A chain of custody document was completed listing sample numbers, date of collection and analyses required. This was signed by each person transferring and accepting custody.

Table 6.2: Groundwater well installation methodology

Well ID	TOC to GW (m)	Drilled depth (m)	Screen interval (m)	Sand pack (m)	Bentonite seal (m)	Finish
'GW1'	5.22	6	3-6	2-6	1-2 (grout 0.5-1)	Gatic
'GW2'	4.97	7	4-7	3-7	2-3 (grout 0.5-2)	Gatic

The groundwater well locations on site are shown approximately in Figure 6.1.



Figure 6.1: Plan showing approximate location of groundwater wells

6.3 Groundwater chemical analysis

Primary water samples were submitted for chemical testing to the NATA accredited analytical laboratory of Eurofins MGT. NATA accredited Envirolab was used as the secondary laboratory to assess the inter-laboratory duplicate split samples.

The sample list and associated analytical testing is presented in the chain of custody documentation included in Appendix F, and the chemicals analysed for are summarised below:

- Primary samples:
  - Vic EPA IWRG 621: TRH/ PAH/ Phenols/ OCP/ PCB/ VOC/ Vinyl Chloride/ Metals (As, Cd, Cr, Cu, Ni, Pb, Hg, Ag, Sn, Mo, Se, Zn)/ Cr6+/ CN/ Total Fluoride/ pH
  - Total dissolved solids (TDS)
- Rinsate
  - Heavy metals (18)
- Trip blank
  - TPH_{C6-C9} and BTEX
- Duplicates
  - Heavy metals (18)

The analytical methods used are described on copies of the analytical laboratory certificates provided in Appendix F.

6.4 Environmental values

Environmental values are defined in the *South Australia Environment Protection (Water Quality) Policy 2015* (EPP 2015). An extract from the EPP 2015 showing the environmental values that apply in relation to waters is provided in Table 6.3.

Table 6.3: Environmental values of particular waters – an extract from *South Australia Environment Protection (Water Quality) Policy 2015*

Waters	Aquatic ecosystem	Recreation and aesthetics	Drinking water for human consumption	Primary industries—irrigation and general water uses	Primary industries—livestock drinking water	Primary industries—aquaculture and human consumption of aquatic foods
Public stormwater systems	X	X				
Surface waters in a water protection area (within the meaning of section 61 of the Act)	X	X	X	X	X	X
Underground waters as follows:						
(a) underground waters with a background TDS level of less than 1 200 mg/L			X	X	X	X
(b) underground waters with a background TDS level of 1 200 mg/L or more, but less than 3 000 mg/L				X	X	X
(c) underground waters with a background TDS level of 3 000 mg/L or more, but less than 13 000 mg/L					X	X

The average total dissolved solids (TDS) measurement from 'GW1' and 'GW2' was 1,400mg/L (refer to Section 6.6.4). Table 6.3 shows that irrigation and general water uses, livestock drinking water and aquaculture are the only applicable protected environmental values of groundwater with a TDS of 1,200-3,000 mg/L (circled in Table 6.3).

6.5 Guideline specifications

The guidelines used for the assessment of the analytical results are presented in Table 6.4. These protect the applicable protected environmental values of groundwater with a TDS of 1,400 mg/L.

Table 6.4: Applicable groundwater assessment guideline

Criteria	Applicability	Environmental value
ANZECC (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality		
Agricultural irrigation water long term use trigger values	The Australian National Water Quality Management Strategy presents trigger values for chemicals that may be found in fresh and marine waters. These are the concentrations of the key performance indicators measured for the ecosystem, below which there exists a low risk that adverse biological (ecological) effects will occur. They indicate a risk of impact if exceeded and should 'trigger' some action, either further ecosystem specific investigations or implementation of management/remedial actions.	Irrigation and general water uses
Livestock drinking water trigger value (low risk)		Livestock drinking water
Aquaculture and human consumption of aquatic foods (freshwater production)		Aquaculture and human consumption of aquatic foods
NEPM Health Screening Levels for Vapour Intrusion (HSLs)		
NEPM HSL A & HSL B (Low-high density residential) - Clay	Investigation levels for soil and soil vapour in the assessment of site contamination. These guidelines consider concentrations in soil and take into consideration soil types, depths of contaminant concentrations in the soil profile, the depth to groundwater and the nature of the overlying soils. The conservative HSL-A (Low Density Residential) and HSL-B (High Density Residential) guidelines for clay are used in this assessment.	

6.6 Results

6.6.1 Drilling observations

Fill was observed to approximately 1m bgl, below which was sandy clay to a depth of 4.5-5m bgl, underlain with a gravel layer between approximately 4.5-6m bgl and sandy clay to the final depth. Standing water level was observed at approximately 5.22m bgl in 'GW1' and 4.97m bgl in 'GW2'.

No odour, staining or sheen was observed. The PID results from the soil samples retrieved were measured at 0 ppm. This indicates that the likelihood of volatile gases being present in the soil at the site is low.

Refer to Appendix E for a detailed description of the soil encountered during drilling of the groundwater wells.

6.6.2 Field results

Refer to Appendix C for a summary of the measured field parameters.

6.6.3 Groundwater flow direction

The inferred regional groundwater flow direction at the site is westerly.

Laboratory results

The laboratory results for the water samples analysed for the chemicals of interest were below the adopted ANZECC (2000) criteria and NEPM HSL A & HSL B (Low-high density residential, clay) criteria, with the exception of the following:

- Manganese (0.055 mg/L) (filtered: 0.047 mg/L) which exceeded the ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production) guideline of 0.01mg/L.
- Molybdenum (filtered) (0.025 mg/L) which exceeded the ANZECC (2000) Agricultural irrigation water long term use trigger value of 0.01mg/L.

It is considered that the above reported Molybdenum and Manganese concentrations are likely to be reflective of background conditions.

The average laboratory pH measurement for ‘GW1’ and ‘GW2’ was 7.5. The average total dissolved solids (TDS) measurement for ‘GW1’ and ‘GW2’ was 1,400mg/L.

The associated chain of custody documentation, laboratory certificates of analysis and a summary of the results in the context of the applicable guidelines are presented in Appendix F and H respectively.

6.6.4 Quality assurance/quality control (QA/QC)

6.6.4.1 Data validation

A summary of the QA/QC activities undertaken to ensure integrity of the groundwater data collected is provided in Table 6.6. The results indicate conformance with the specific QA/QC procedures.

Table 6.5 Data validation

QA/QC requirement	Acceptable?	Comments
Samples collected in accordance with standard operating procedures, incorporating appropriate sections of AS 4482.1 – 2005 and AS 4482.2-1999 for sampling of non-volatile components.	Yes	None
Samples delivered to laboratory with correct preservative.	Yes	None
Samples delivered to laboratory within sample holding times.	Yes	None
All analyses NATA accredited.	Yes	None
Required number of sample duplicates analysed.	Yes	None
Sample duplicates reported RPDs within limits set by AS4482.1.	Yes	RPDs are discussed and presented in Table 6.6. These RPDs are not considered to have compromised the integrity of the results.
Laboratory limits of reporting (LOR)	Yes	The LORs are presented in the laboratory certificates of analysis (Appendix F). All LORs are suitable for the purposes of this investigation.
Laboratory internal QC	Yes	The results obtained for the primary laboratory internal QC samples were within the acceptable limits of repeatability, with RPD values reported for all internal duplicate pairs within the acceptable range of 30% stipulated by MGT. Further to the above, it is noted that all RPD values are within the acceptable range of 50% stipulated by AS4482.1-2005 adopted in this report. The results obtained for the secondary laboratory internal QC samples were within the acceptable limits of repeatability, with RPD values reported for all internal duplicate pairs within the acceptable range specified for that chemical. The recoveries from the laboratory control spike samples were within the specified ranges. The laboratory method blank samples were reported the below the reporting limits, indicating low likelihood of false positive results.
Trip blank	Yes	A trip blank 'TRIP_5/9/16' was included in the sample esky during the 5/9/16 groundwater sampling event and was analysed for TPH_{C6-C9} and BTEX at Eurofins MGT. The results were reported below LOR.
Rinsate	Yes	A rinsate sample 'RIN_5/9/16' was retrieved from the clean low flow pump during the 5/9/16 groundwater sampling event and analysed for HM(18) at Eurofins MGT. The results were below LOR.

6.6.4.2 Duplicate analysis

Field duplicate (blind replicate) soil samples were collected to provide a check on sample variability and laboratory performance and accuracy.

Validation and interpretation of the quality control data was undertaken by calculating the relative percentage differences (RPDs) for the primary sample and duplicate sample concentrations. The RPD value for an analyte was calculated using the formula:

RPD (%) = 100[(x1 – x2)/x] where x1, x2 = duplicate results and x = mean of duplicate results.

According to AS4482.1-2005, typical RPD values for soils range from ±30 to ±50%; an RPD within the range of -50% to 50% is considered to show acceptable agreement and, conversely, data is considered to have poor agreement where an RPD is outside this range.

Table 6.6: Groundwater intra-laboratory and inter-laboratory QC samples

Date	Primary sample	Replicate sample (intra-laboratory)	Replicate sample (inter-laboratory)	Analytes	Relative Percent Difference	Acceptable for the purposes of this assessment?
5/9/2016	'GW2'	'DUP1'	-	Metals	All within acceptance value of 50%, with the exception of filtered Copper (67%)	Yes. These differences may be attributed to the results being close to LOR where accuracy is diminished and are not considered to significantly impact the reliability of this assessment.
5/9/2016	'GW2'	-	'DUP2'	Metals	All within acceptance value of 50%, with the exception of Selenium (67%)	Yes. These differences may be attributed to the presence of sediment in the sample(s) and are not considered to significantly impact the reliability of this assessment.

6.6.4.3 Summary

Based on the results of the evaluation of the QA/QC data for groundwater, it is considered that:

- The sampling methods and QA/QC for field procedures are considered to be suitable for the purpose of this assessment.
- The rinsate sample results were acceptable for the purpose of this assessment.
- The trip blank results were acceptable for the purpose of this assessment.
- The elevated RPD% concentrations for dissolved metals (copper and selenium) are likely due to the results being close to LOR where accuracy is diminished and/or the presence of sediment in the samples. The results are considered to be acceptable for the purpose of this assessment.
- The field and laboratory quality assurance measures implemented are considered to provide an acceptable level of confidence that the data collected and reported is appropriately complete, comparable and representative.
- The field and laboratory quality control measures implemented are considered to provide an acceptable level of confidence that the data collected and reported is appropriately accurate and precise.

Therefore, it is concluded that the data collected for the groundwater investigation is considered to be reliable and usable for the assessment of the condition of the site.

6.7 Beneficial use assessment

The purpose of a beneficial use assessment (BUA) is to determine what beneficial uses of groundwater need to be protected at the site. As outlined in the EPA (2009b), *Site Contamination: Guidelines for the Assessment and Remediation of Groundwater Contamination* (February 2009) and in accordance with the NEPC (1999), a BUA should assess the groundwater on the basis of its suitability for current or realistic future use, and the risk use may pose to human health and the environment. Potential realistic beneficial uses are those that could be supported by the background groundwater quality and the inherent ability of the aquifer to support these uses.

The beneficial use assessment should be linked to the environmental values as defined in the *South Australia Environment Protection (Water Quality) Policy 2015* (EPP 2015). An extract from the EPP 2015 showing the environmental values that apply in relation to waters is provided in Table 6.3.

The average total dissolved solids (TDS) measurement for 'GW1' and 'GW2' was 1,400mg/L. Table 6.3 shows that irrigation and general water uses, livestock drinking water and aquaculture are the applicable protected environmental values of groundwater with a TDS of 1,400 mg/L.

All protected environmental values listed in the EPP 2015, their relevance to the groundwater at this site and the justification for this relevance are included in Table 6.7.

Table 6.7: Protected environmental values and relevance to site

Potential Beneficial Use	Relevant to site?	Justification
Fresh aquatic ecosystems	No	No fresh aquatic systems are located in proximity to the site.
Marine aquatic ecosystems	No	No marine aquatic systems are located in proximity to the site.
Potable	No	Based on the average reported TDS of 1,400 mg/L for 'GW1' and 'GW2', the groundwater at the site is not suitable for potable use. In accordance with the EPP (2015), drinking water is not a protected beneficial use for groundwater with TDS of 1,400 mg/L. Groundwater is not proposed for extraction at the site and as there is a reticulated water supply, there is considered to be little realistic likelihood of groundwater extraction for potable use. The DEWNR groundwater database indicates that there are no domestic groundwater wells within 0.4km of the site.
Primary contact recreational use	No	The DEWNR groundwater database indicates that there are no applicable groundwater wells within 0.4km of the site. Groundwater is not proposed for abstraction at the site, either during or post building construction.
Aesthetics	No	No groundwater is to be abstracted at the site. The DEWNR groundwater database indicates that there are no groundwater wells within 0.4km of the site.
Irrigation	No	The DEWNR groundwater database indicates that there are no groundwater wells within 0.4km of the site that are used for irrigation purposes.
Livestock	No	Use of groundwater for watering livestock is not known in the area. The DEWNR groundwater database indicates that there are no groundwater wells within 0.4km of the site that are used for livestock purposes.
Aquaculture	No	No applications for aquaculture land use in the area are known or considered likely, therefore this environmental value has not been considered. The DEWNR groundwater database indicates that there are no groundwater wells within 0.4km of the site that are used for aquaculture purposes.
Industrial	No	It is considered unlikely that groundwater would be used for industrial purposes in the area given that a mains water supply is present. The DEWNR groundwater database indicates that there are no groundwater wells within 0.4km of the site that are used for industrial purposes.
Other potential exposure scenarios	**Relevant to site?**	**Justification**
Vapour flux	No	No evidence of volatile or semi-volatile compounds in sufficient concentrations in groundwater at the site to be likely to result in soil vapour.
Buildings and structures	No	Groundwater is unlikely to come into contact with any building footings.

In summary, no protected environmental values listed in the EPP 2015 are relevant to the groundwater at this site.

7 Conceptual Site Model and Assessment of Risk

7.1 Overview of updated Conceptual Site Model

The updated CSM updates the preliminary CSM in Chapter 4. The CSM in Table 7.2 is developed from Mott MacDonald's understanding of the site setting based on the Site History Assessment (Mott MacDonald, 2016) and the soil and groundwater assessments described in Chapters 5 and 6 of this report.

7.2 Risk analysis

This CSM in Table 7.2 ranks the residual environmental and human health risks posed by the site for the proposed use using the risk matrix in Figure 7.1 and Table 7.1.

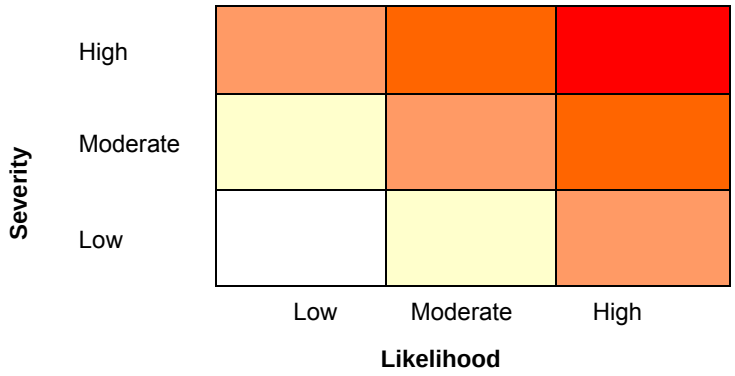


Figure 7.1: CSM residual risk matrix

Table 7.1: CSM residual risk rating

	Negligible
	Low
	Low-Moderate
	Moderate-High
	High

Table 7.2: Conceptual Site Model for proposed development (refer to Figure 7.1 and Table 7.1 for risk analysis matrix used)[2]

Transport/exposure mechanism	Potential receptor(s)	Unmitigated exposure pathway completeness	Unmitigated likelihood of occurrence	Unmitigated consequence severity	Unmitigated risk for undefined generic residential land use	Management measure(s) based on this assessment	Mitigated/residual likelihood of occurrence	Mitigated/residual consequence severity	Residual risk for proposed land use
Soil contamination (heavy metals and BaP) as reported in soil assessment									
Access to soils	Construction workers Residents Visitors Maintenance workers accessing service pits/manholes and/or landscaping.	Potentially complete if not managed.	Low-moderate	Low-moderate	Low	Capping/removal of shallow elevated concentrations, depending on the future use and/or development of the site, particularly in proposed unsealed garden areas. Administrative controls 300mm of clean fill around service trenches Site induction to identify health risks Wear proper personal protective equipment Adhere to appropriate EMP which includes management of dust, stormwater runoff and tracking out onto road	Low	Low	Negligible
Surficial runoff	Recreational users of local surface water Flora and fauna Biota supporting ecological processes	Potentially complete exposure pathway as although no significant surface waterbodies or ecosystems are located within the vicinity of the site, impacted soil could potentially enter the storm water system.	Low	Low	Negligible	Adhere to appropriate EMP which includes management of dust, stormwater runoff and tracking out onto road	Low	Low	Negligible
Vapour	Construction workers Residents Maintenance workers accessing service pits/manholes Future visitors	Incomplete exposure pathway as no significant concentration of volatile compounds was detected by the PID/reported in the analytical soil or groundwater results.	Low	Low	Negligible	Not required	Low	Low	Negligible
Use by plants	Flora and fauna	Potentially complete if not managed.	Low	Low	Negligible	Possible removal of these concentrations, depending on the future use and/or development of the site in proposed unsealed inground garden areas.	Low	Low	Negligible
Groundwater as reported in groundwater assessment									
Extraction and use of groundwater at the site for potable and/or recreational use	Residents Visitors Landscaping workers	Incomplete exposure pathway as no groundwater is proposed for abstraction at the site.	Low	Low	Negligible	No abstraction	Low	Low	Negligible
Extraction and use of groundwater off-site for potable and/or recreational use	Existing or potential domestic users of downgradient groundwater	Incomplete exposure pathway as the DEWNR groundwater database indicates that there are no domestic groundwater wells within 0.4km of the site.	Low	Low	Negligible	Not required	Low	Low	Negligible
Vapour	Construction workers Residents Maintenance workers accessing service pits/manholes Future visitors	Incomplete exposure pathway as no significant concentration of volatile compounds was detected by the PID/reported in the analytical soil or groundwater results.	Low	Low	Negligible	Not required	Low	Low	Negligible
Use by plants	Flora and fauna	Incomplete exposure pathway as groundwater is located at approximately 5m bgl at the site, which is beyond the depth of plant roots.	Low	Low	Negligible	Not required	Low	Low	Negligible

[2] CSM based on proposed future land use

8 Discussion

This intrusive soil and groundwater investigation has found that there does not appear to be significant gross or widespread soil or groundwater contamination at the site that would, in our opinion, preclude the proposed redevelopment of the site.

We understand the nature of the proposed development to be elevated multi-storey residential apartments. The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark on the first level. Groundwater is not proposed for abstraction at the site. There would be limited opportunity for access to subsurface soils once developed.

No chemical of interest concentrations were reported above applicable groundwater guidelines (with the exception of two metal concentrations that are considered to be representative of natural background conditions). The reported groundwater chemical concentrations do not present a significant risk in terms of the potential future development, including no risk to human health as no groundwater is to be abstracted as part of the proposed development and there was no evidence of vapour generating compounds at concentrations that would pose a vapour generation risk.

It is recommended that further consideration be given to the shallow fill at the site, which we understand is to be removed during demolition for geotechnical/structural and final site level purposes. Metal and Benzo(a)pyrene concentrations at shallow depths were reported above applicable guidelines in the fill layer encountered across the northern half of the site. Other minor elevated chemical concentrations were reported across the site; however, these were below guideline criteria/do not have associated criteria. These shallow concentrations were each vertically delineated. Typical management measures as per Table 7.2 may need to be considered during construction however, these measures are not considered to be material in terms of the assessment of the suitability of the site for the proposed development.

9 References

- ANZECC/NHMR.C (1992). Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites.
- Department of Environment, Water and Natural Resources. Groundwater Database website. Available at: https://www.waterconnect.sa.gov.au
- Department of Planning, Transport and Infrastructure. Property Assist website. Available at: http://maps.sa.gov.au/plb/
- *Ecological investigation levels - Interactive (Excel) Calculation Spreadsheet* (available at http://www.scew.gov.au/node)
- *Environment Protection Act 1993*
- *Environment Protection Regulations 2009*
- Mott MacDonald Australia Pty Ltd (29 April 2016). '*Preliminary Environmental Site History Assessment_25 College Road, Kent Town, South Australia*'.
- NEPM (1999) (as amended 2013) National Environment Protection (Assessment of Site Contamination) Measure. National Environment Protection Council, Australia
- Planning Advisory Notice No. 20 – Site Contamination
- SA EPA (2010) 'Current criteria for the classification of waste – including Industrial and Commercial Waste (Listed) and Waste Soil'
- SA EPA (January 2009). EPA Guidelines. *Site contamination—what is site contamination?*
- South Australia 1: 250 000 Scanned Geological Maps Published and Unpublished. Department for Manufacturing, Innovation, Trade, Resources and Energy. Version 2008:2.
- Standards Australia (1999) Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 2: Volatile Compounds. AS4482.2-1999, Homebush NSW
- Standards Australia (2005) Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds. AS4482.1-2005 Homebush NSW
- Standards Australia (2005) Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 2: Volatile Compounds. AS4482.1-2005 Homebush NSW
- Standards Australia. Guide to the investigation and sampling of sites with potentially contaminated soil – AS 4482.1-2005.

10 Limitations

Mott MacDonald Australia Pty Ltd (Mott MacDonald) has prepared this report based on generally accepted practices and standards in operation at the time that it was prepared. No other warranty is made as to the professional advice included in this report. All parties should satisfy themselves that the scope of work conducted and reported herein meets their specific needs before relying on this document.

Mott MacDonald believes that its opinions have been developed according to the professional standard of care for the environmental consulting profession at the date of this document. That standard of care may change as new methods and practices of exploration, testing, analysis and remediation develop in the future, which may produce different results.

Environmental conditions are created by natural processes and human activity, and as such may change over time e.g. groundwater levels may rise or fall, contamination may migrate and fill may be added to the site. This report therefore presents a point in time assessment of the site, and as such can only be valid for the time at which the investigation was undertaken.

Any investigation such as that contained in this report can examine only a fraction of the subsurface conditions at the site. There remains a risk that pockets of contamination or other hazards may not be identified as investigations are necessarily based on sampling at localised points. Certain indicators or evidence of hazardous substances or conditions may have been outside the portion of the subsurface investigated or monitored, and thus may not have been identified or their full significance appreciated. As such, the identified environmental conditions reported are only valid at the points of direct sampling and any derived or interpolated conditions may differ from these targeted locations and cannot be assumed to be indicative of the remainder of the site.

The methodology adopted and the sources of information used are outlined in this report. Mott MacDonald has limited its investigation to the scope agreed for this contract and it is possible that additional sampling and analysis could produce different results and/or opinions. Mott MacDonald has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions.

This assessment assumes that the proposed development meets requirements as outlined in the Building Code of Australia and Australian Standards. If these recommendations are not met, there is potential for the exposure and therefore risk to building users to be higher than that presented in this assessment.

The soil descriptions contained in this report have not been prepared for engineering design purposes and the reinstatement of any sampling locations were not conducted in accordance with any supervised filling or geotechnical standard. The term suitable has been used in the context of a request from the planning authority and means that the concentrations reported did not exceed the guideline concentrations adopted for the proposed land use/exposure pathway.

This report does not include the assessment or consideration of hazardous building materials, including asbestos. Such materials should be assessed and managed by a qualified and licensed assessor/contractor. Mott MacDonald makes no warranty or representation as to the presence or otherwise of asbestos and/or asbestos containing materials (“ACM”) on the site. If

fill has been imported on to the site at any time, or if any buildings constructed prior to 1970 have been demolished on the site or materials from such buildings disposed of on the site, the site may contain asbestos or ACM. Even if asbestos was tested for and those test results did not reveal the presence of asbestos at specific points of sampling, asbestos may still be present at the site if fill has been imported at any time, or if any buildings constructed prior to 1970 have been demolished on the site or materials from such buildings disposed of on the site.

In general, the available scientific information pertaining to contamination is insufficient to provide a thorough understanding of all of the potential toxic properties of chemicals to which humans may be exposed. The majority of the toxicological knowledge of chemicals comes from experiments with laboratory animals, where there may be interspecies differences in chemical absorption, metabolism, excretion and toxic response. There may also be uncertainties concerning the relevance of animal studies using exposure routes that differ from human exposure routes. In addition, the frequent necessity to extrapolate results of short-term or subchronic animal studies to humans exposed over a lifetime has inherent uncertainty. Therefore, in order to conduct an environmental assessment, it is necessary to take into account these inherent uncertainties and extrapolate information from the data that is available, considered current and endorsed as acceptable for the assessment of risks to human health. There is therefore inherent uncertainty in the process, and to compensate for uncertainty, conservative assumptions are often made that result in an overestimation rather than an underestimation of risk.

All advice, opinions or recommendations contained in this document should be read and relied upon only in the context of the document as a whole. This report does not purport to give legal advice as this can only be given by qualified legal practitioners. This document does not represent a Site Contamination Audit Report.

This report has been prepared on the following assumptions:

(a) all documents and materials disclosed to us are accurate, complete and without material omission;

(b) all documents supplied to us and reviewed by us are true and complete copies of the originals;

(c) all information and documentation supplied to and reviewed by us in connection with the preparation of this report remains true and complete as at the date of this report and is not misleading;

(d) all opinions and views expressed by those involved in the preparation of this report are based on reasonable assumptions and all statements of fact by any of those persons are true and not misleading;

(e) we assume that none of the parties to any document we have reviewed is, or will be, seeking to conduct any relevant transaction in a manner or for a purpose not evidenced on the face of the document which might render the document or any relevant transaction illegal, void or voidable;

(f) all relevant approvals and consents have been obtained and complied with in respect of any development, construction and occupation of the site

(g) the information on any public file or register which has been searched by us, and each search result, is complete, accurate and correct as at the date of conducting that search.

This report does not cover tax, commercial, employment, occupational health and safety, insurance, accounting or financial matters, matters of business judgement or technical, operational or planning matters.

We cannot comment on whether or not information provided as a result of our searches of the public registers may have changed between the date of our search of the various registers (which is indicated in this report) and the date of this report.

Our review has not been an audit. We have not applied a system of checks intended to uncover gaps, although we have noted where a document which we think is material has not been provided to us.

Mott MacDonald has tested only for those chemicals specifically referred to in this report. Mott MacDonald makes no statement or representation as to the existence (or otherwise) of any other chemicals.

No investigations have been undertaken into any off-site conditions, or whether any adjoining sites may have been impacted by contamination or other conditions originating from this site.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and contamination may have been identified in this report.

Appendices

A.	DEWNR groundwater data	50
B.	Groundwater well installation permits	51
C.	Groundwater field parameters	52
D.	Calibration certificates	53
E.	Soil logs and groundwater well construction details	54
F.	Chain of custody documentation and certificates of analysis	55
G.	EIL spreadsheet outputs	56
H.	Result summary tables	60
I.	Honesty in reporting form	61
J.	Previous site history assessment report	62

A. DEWNR groundwater data

WaterConnect

Groundwater Data Report

Government of South Australia
Department of Environment, Water and Natural Resources

Circle Centre -34.921398,138.62179, Radius 0.400km

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	TDS (mg/L)	TDS Date	Date	Cased To (m)	Yield (L/sec)	Yield Date	Purpose	Obs No	SWL Status	Salinity Status	Aquifer	Status	Permit No
6628-97	11.99	11.99	9.25	19/07/1934	1028	19/07/1934											
6628-98	6.71	6.71			1257	09/10/1914											
6628-100	10.06	10.06			1499	10/12/1914											
6628-101	15.24	15.24			1100	28/10/1914											
6628-143	13.72	13.72			350	05/04/1976	01/01/1964	13.72	2.5	01/01/1976	OBS						
6628-144	39.62	39.62					01/01/1955	39.62	0.76	01/01/1976							
6628-145	22.86	22.86	7.95	21/09/1991	1245	15/01/1992	01/01/1971	22.86				ADE051	H	N	Qpah	NIU	
6628-12924	27	27	5.4	14/02/1984	1160	14/02/1984	14/02/1984	17.5	1.38	14/02/1984	TWS					OPR	13790
6628-17123	8	8					29/01/1995	8			INV						34059
6628-17124	10	10	4.3	28/01/1995			28/01/1995	10			INV						34060
6628-17125	7.7	7.7					29/01/1995	7.7			INV						34061
6628-21230	11	11	8	07/01/2003			07/01/2003	11			MON						60544
6628-22619	8.5	8.5	5.2	26/07/2006			26/07/2006	8.5			INV						119364
6628-22620	9	9	5.2	26/07/2006			26/07/2006	6			INV						119365

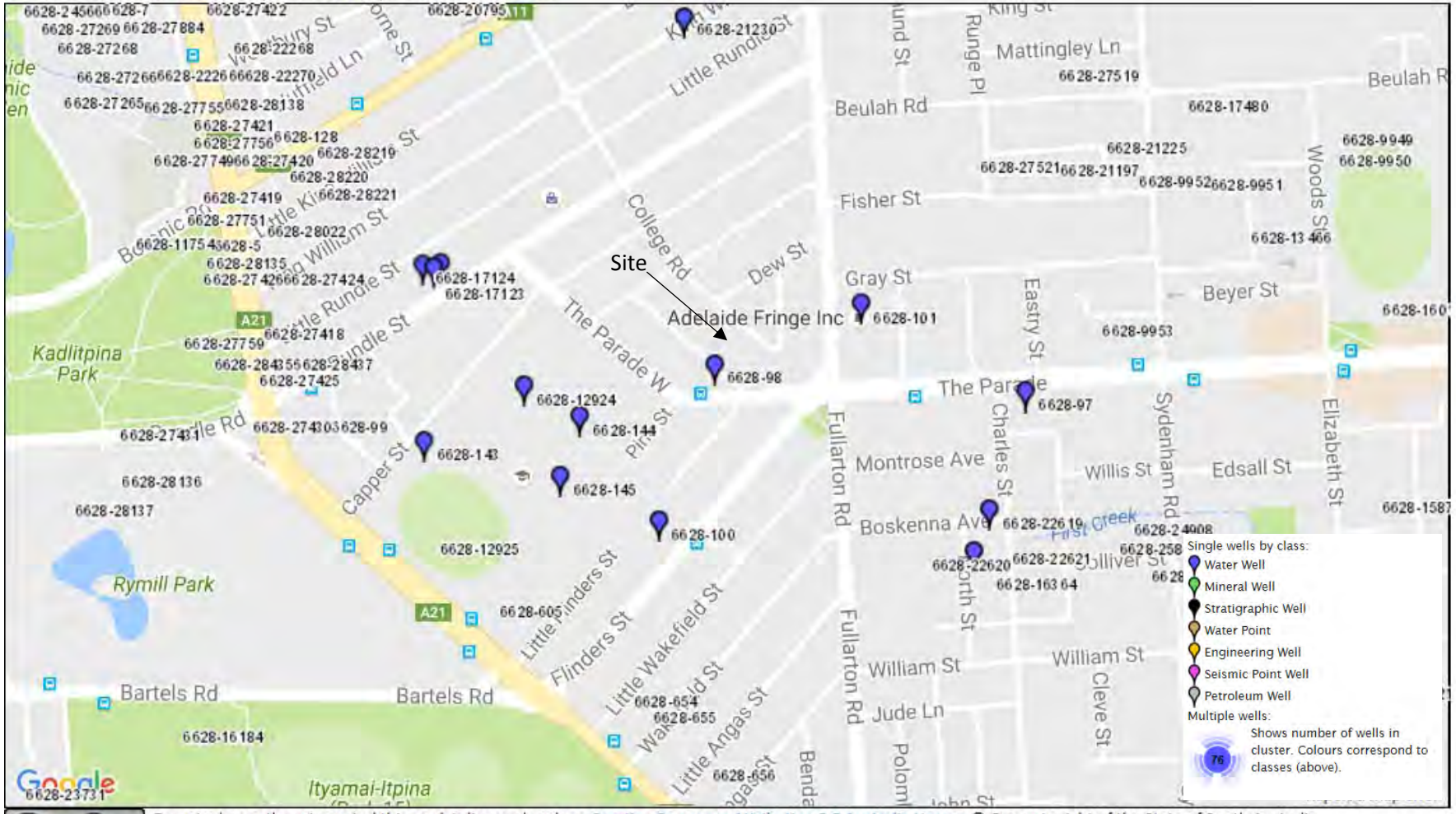
14 records

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Government of South Australia

WaterConnect

Circle Centre -34.921398,138.62179, Radius 0.400km



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B. Groundwater well installation permits

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT OF ENVIRONMENT, WATER AND NATURAL RESOURCES

PO Box 1046 Mt Gambier SA 5290
Ph: 8735 1134 Fax: 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 135 of the *Natural Resources Management Act 2004*

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	271663
Expiry Date:	03/08/2017

Permission is hereby granted to:

25 CKT PTY TD
ACN 612 640 605
LEVEL M
22 KING WILLIAM STREET
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction
Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 6130/16
   Allotment 25 in Deposited Plan 49351
   Hundred of Adelaide

2. Well Constructon must be in accordance with the General Specification for Well Construction, Modification and Abandonment in South Australia (or any subsequent or related policy), as provided by the relevant authority
3. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
4. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
5. This work may be subject to inspection by the Department's Drilling Inspectors.
6. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000

(Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Third Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.

7. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
8. Water samples are required from all wells drilled in respect of this permit.
9. Strata samples are not required.
10. The licensed well driller must forward with his report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
11. All wells must be drilled vertical unless written permission is obtained from the Minister.
12. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
13. A lithological log is to be submitted with the drillers well construction report from all wells drilled in respect of this permit in accordance with National Environmental Protection (assessment of Site Contamination) measure 1999.

NOTES:

1. Under section 202(1)(b)(ii) of the Natural Resources Management Act 2004, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
6. Due to potential land contamination issues it is recommended that a hydrogeological assessment be carried out to determine the long term prospects for groundwater quality and quantity with regard to the site and desired use.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or omissions may result in the variation, suspension or revocation of the permit.

Sonya Knight
SENIOR WATER LICENSING OFFICER
Delegate of Minister for Sustainability, Environment and Conservation

Date: 3/08/2016

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT OF ENVIRONMENT, WATER AND NATURAL RESOURCES

PO Box 1046 Mt Gambier SA 5290
Ph: 8735 1134 Fax: 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 135 of the *Natural Resources Management Act 2004*

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

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25 CKT PTY TD
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   Hundred of Adelaide

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3. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
4. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
5. This work may be subject to inspection by the Department's Drilling Inspectors.
6. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000

(Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Third Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.

7. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
8. Water samples are required from all wells drilled in respect of this permit.
9. Strata samples are not required.
10. The licensed well driller must forward with his report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
11. All wells must be drilled vertical unless written permission is obtained from the Minister.
12. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
13. A lithological log is to be submitted with the drillers well construction report from all wells drilled in respect of this permit in accordance with National Environmental Protection (assessment of Site Contamination) measure 1999.

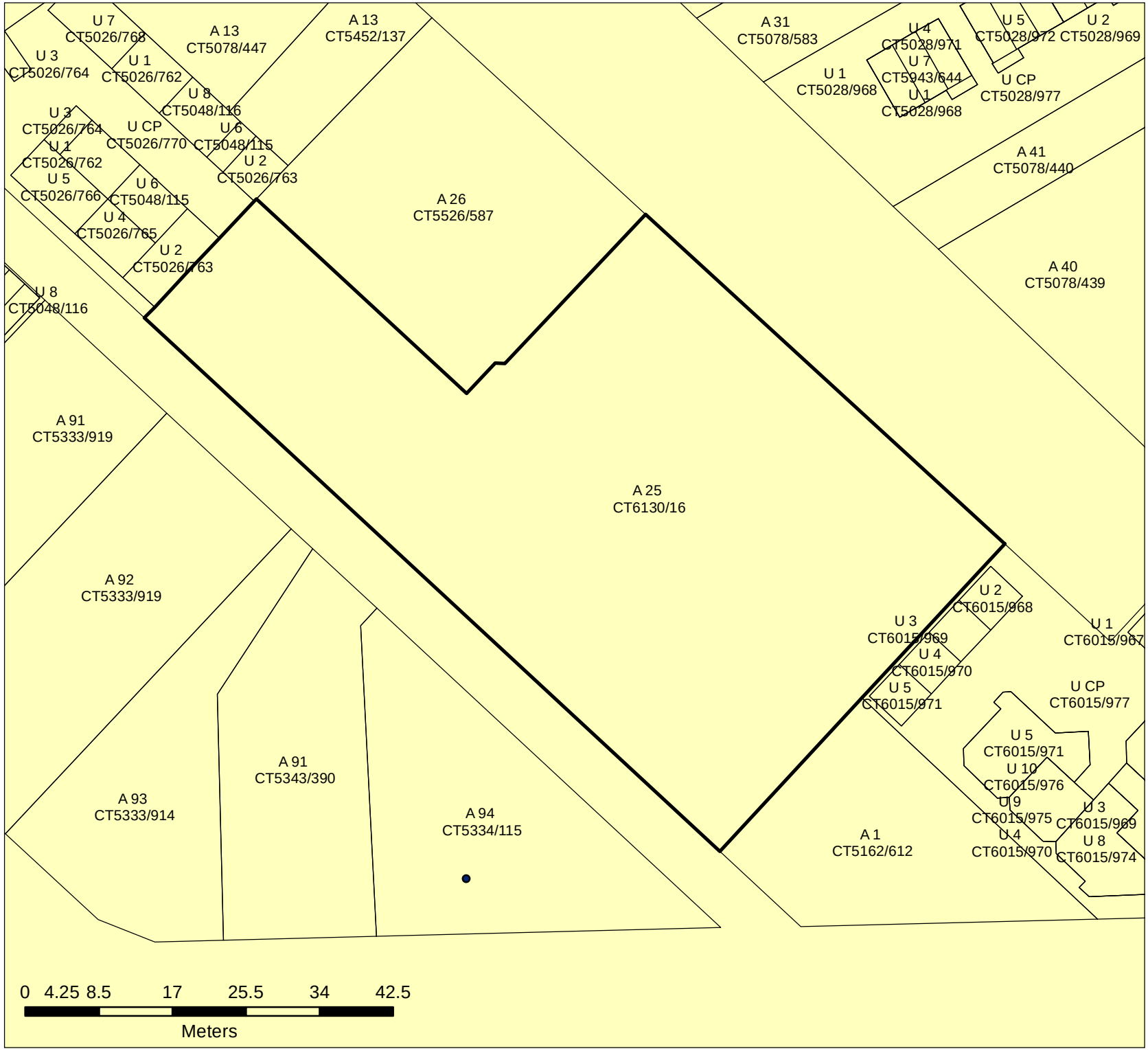
NOTES:

1. Under section 202(1)(b)(ii) of the Natural Resources Management Act 2004, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
6. Due to potential land contamination issues it is recommended that a hydrogeological assessment be carried out to determine the long term prospects for groundwater quality and quantity with regard to the site and desired use.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or omissions may result in the variation, suspension or revocation of the permit.

Sonya Knight
SENIOR WATER LICENSING OFFICER
Delegate of Minister for Sustainability, Environment and Conservation

Date: 3/08/2016



N

PLEASE ATTACH WELL LOCATION MAP TO THE DRILLERS REPORT

CUSTOMER: 25 CKT PTY LTD
Permit No: 271663 271664
Prescribed Area/NOP: CAGA
Hundred: ADELAIDE
Suburb: KENT TOWN
NRM Region/Plan: AMLR
CT6130/16 D49351 LOT 25

Legend

- DCDB.ParcelCadastreFull
- WATER.Drillholes
- WATER.Depth_to_Groundwater
- Contaminated_Sites
- Watercourse
- Wetland_GDEs
- ADMIN.SWMA_SouthAustralia

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Government of South Australia
Department of Environment, Water and Natural Resources

C. Groundwater field parameters

MOTT MACDONALD

Groundwater well purging & sampling data

Client: 25 CKT Pty Ltd

Project name and number: 371786

Location: 25 College Rd, Kent Town

Weather: Sunny/clear

Date purged and sampled: 5/9/16

Sampled by: BB & RJ

Groundwater well ID				GW2				
Depth to groundwater (m, bTOC)				4.91				
Notes								
Time	**Drawdown (m)**	**Purge vol (L)**	**pH**	**Redox (ORP)**	**T (^{0}C)**	**EC (SPC µs/cm)**	**DO (mg/L)**	**Comments**
Start 10:50	4.84	0	-	-	-	-	-	Cloudy/ Silty
10:55	4.96	1	7.0	-90.8	20.3	2810	3.00	
11:00	5.08	2.5	7.06	-113.9	20.4	2814	2.92	Becoming clearer
11:05	5.21	4						
11:10	5.28	5.5	7.21	-98.2	20.4	2777	4.35	
11:15	5.38	6.5	7.28	-88.2	20.5	2814	4.83	
11:20	5.44	8.0	7.33	-81.7	20.5	2811	4.86	

MOTT MACDONALD

Groundwater well purging & sampling data

Client: 25 CKT Pty Ltd

Project name and number: Kent Town 371786

Location: 25 College Rd Kent Town

Weather: Sunny/clear

Date purged and sampled: 5/9/16

Sampled by: BB & RJ

Groundwater well ID				GW1				
Depth to groundwater (m, bTOC)				4.74				
Notes								
Time	**Drawdown (m)**	**Purge vol (L)**	**pH**	**Redox (ORP)**	**T (^{0}C)**	**EC (SPC µs/cm)**	**DO (mg/L)**	**Comments**
11:58	4.74							
12.35	-	1	8.04	-146.8	20.4	2605	4.35	Limited water available grab sample required

D. Calibration certificates

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
Serial No. **11k101261**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		MK1402	pH 7.04
2. pH 4.00		pH 4.00		MK1078	pH 4.00
3. mV		231 mV		ND2197/ND2196	243mV
4. EC		2.76 mS		MG1508	2.76 mS
6. D.O		0 ppm		146	0 ppm
7. Temp		16.7		MultiTherm	15.9

Calibrated by: **Wilma Fouché**

Calibration date: **2-Sep-16**

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105434

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	PID	✓	10.6 ev
Alarms	Beeper	✓	Low: 50ppm; High: 100ppm; TWA: ; STEL:
	Settings	✓	
Software	Version	✓	
Data logger	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
PID Lamp		100ppm Isobutylene	NIST	AD50		100.1ppm

Calibrated by: Wilma Fouché

Calibration date: 23/08/2016

Oil / Water Interface Meter

Instrument Geotech Interface Meter (60M)
Serial No. 4497

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	8.8V
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Wilma Fouché**

Calibration date: **31/08/2016**

16/08/2016

Oil / Water Interface Meter

Instrument Geotech Interface Meter (60M)
Serial No. 4497

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	8.9V
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: **Wilma Fouché**

Calibration date: **16/08/2016**

E. Soil logs and groundwater well construction details

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB01

NOT FOR CONSTRUCTION PURPOSES

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 2.0m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
	0.05	Bitumen Surface	No Odour	0	SB01/1_0.05-0.2 QC01
		FILL SAND yellow colour, loose consistency, slightly moist, large quartzite gravels to 15mm, fine to coarse grain			
	0.6	FILL Clayey SAND dark brown colour, fine to medium grain, dry, tiny red brick fragments, medium dense consistency	No Odour	0	SB01/2_0.6-0.7
	1.0	Sandy CLAY red brown colour, stiff consistency, high plasticity, dry	No Odour	0	SB01/3_1.0-1.1
	EOH 2.0m bgl		No Odour	0	SB01/4_1.9-2.0

0.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	**FILE**

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB02

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.8m bgl

	LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
0.0			Ground Surface			
		0.05	Bitumen Surface	No Odour	0	SB02/1_0.05-0.2
		0.3	FILL SAND white yellow colour, loose consistency, slightly moist, large quartzite gravels to 15mm, fine to coarse grain	No Odour	0	SB02/2_0.3-0.4 QC02
1.0		1.0	FILL Clayey SAND dark brown colour, fine to medium grain, medium dense consistency	No Odour	0	SB02/3_1.0-1.1
		EOH 1.8m bgl	Sandy CLAY red brown colour, dense consistency, high plasticity, dry, fine to medium grain	No Odour	0	SB02/4_1.7-1.8
2.0						
3.0						
4.0						

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

Reviewed By: **FILE**

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
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SOIL BOREHOLE LOG SB03

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.5m bgl

	LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
0.0			Ground Surface			
		0.05	Bitumen Surface	No Odour	0	SB03/1_0.05-0.2
			FILL SAND yellow colour, loose consistency, slightly moist, large quartzite gravels to 15mm, fine to coarse grain			
		0.4	FILL Clayey SAND dark brown colour, fine to medium grain, medium dense consistency, dry, some black staining at 0.4m, possibly decomposed vegetation.	No Odour	0	SB03/2_0.4-0.5 QC03
1.0		1.0	Sandy CLAY red brown colour, firm consistency, high plasticity, dry, fine to medium grain	No Odour	0	SB03/3_1.0-1.1
		EOH 1.5m bgl				
2.0						
3.0						
4.0						

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	**FILE**

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22 King William St
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SOIL BOREHOLE LOG SB05

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 3.0m bgl

	LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
0.0			Ground Surface			
		0.05	Bitumen Surface	No Odour	0	SB05/1_0.05-0.2
		0.3	FILL SAND yellow colour, loose consistency, slightly moist, large white quartzite gravels to 15mm, fine to coarse grain	No Odour	0	SB05/2_0.3-0.4
1.0		1.0	Sandy CLAY red brown colour, fine to medium grain, dense consistency, slightly moist, medium plasticity	No Odour	0	SB05/3_1.0-1.1
2.0		2.0	Clayey SAND yellow brown colour, medium dense consistency, slightly moist, medium grain	No Odour	0	SB05/4_2.0-2.1
		EOH 3.0m bgl		No Odour	0	SB05/5_2.9-3.0
3.0						
4.0						

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

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SOIL BOREHOLE LOG SB06

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.5m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		Ground Surface			
	0.05	Bitumen Surface	No Odour	0	SB06/1_0.05-0.2
	0.3	FILL SAND white yellow colour, loose consistency, slightly moist, large quartzite gravels to 15mm, fine to coarse grain	No Odour	0	SB06/2_0.3-0.4 QC04
	0.9	Sandy CLAY red brown colour, high plasticity, fine to medium grain, dry	No Odour	0	SB06/3_0.9-1.0
	EOH 1.5m bgl	Clayey SAND brown colour, dense consistency, slightly moist, fine to medium grain	No Odour	0	SB06/4_1.4-1.5

0.0
1.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

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Adelaide
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SOIL BOREHOLE LOG SB08

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.5m bgl

	LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
0.0			~~Ground Surface~~			
			Paved Surface			
		0.09				
		0.2	Concrete - note that jackhammer used to clear concrete causing increased potential for concrete dust to potentially impact core samples taken below.	No Odour	0	SB08/1_0.2-0.3 QC05
			FILL Clayey SAND brown colour, dense consistency, dry, fine to medium grain			
1.0		1.0	Sandy CLAY red brown colour, firm consistency, high plasticity, dry, fine to medium grain	No Odour	0	SB08/2_1.0-1.1
		EOH 1.5m bgl		No Odour	0	SB08/3_1.4-1.5
2.0						
3.0						
4.0						

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	**FILE**

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SOIL BOREHOLE LOG SB09

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.5m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
	0.09	Paved Surface			
	0.2	Concrete - note that jackhammer used to clear concrete causing increased potential for concrete dust to potentially impact core samples taken below.	No Odour	0	SB09/1_0.2-0.3
		FILL Clayey SAND brown colour, dense consistency, dry, fine to medium grain			
	0.9	Sandy CLAY red brown colour, firm consistency, high plasticity, dry, fine to medium grain	No Odour	0	SB09/2_0.9-1.0
	EOH 1.5m bgl		No Odour	0	SB09/3_1.4-1.5

0.0
1.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

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Adelaide
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SOIL BOREHOLE LOG SB10

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.5m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
	0.0	Paved Surface			
	0.1	FILL Clayey SAND dark brown colour, moist, red brick fragments at 0.1m bgl, fine to medium grain	No Odour	0	SB10/1_0.1-0.2
	1.0				
	1.1	Sandy CLAY brown to red brown colour, firm consistency, medium plasticity, moist, fine to medium grain	No Odour	0	SB10/2_1.1-1.2
	EOH 1.5m bgl	Noted that moisture content may be due to the grading of the paved courtyard area leading to this location receiving rainfall runoff from the building which then flows to the lower northern side.	No Odour	0	SB10/3_1.4-1.5
	2.0				
	3.0				
	4.0				

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	**FILE**

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Adelaide
PO Box 3400
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+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB11

NOT FOR CONSTRUCTION PURPOSES

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 25/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.8m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
		Concrete Surface			
	0.09	FILL Sandy CLAY red brown colour, firm consistency, medium plasticity, dry, fine to medium grain	No Odour	0	SB11/1_0.09-0.2 QC06
	0.8	Sandy CLAY red brown colour, dense consistency, high plasticity, dry, fine to medium grain	No Odour	0	SB11/2_0.8-0.9
	EOH 1.8m bgl		No Odour	0	SB11/3_1.7-1.8

0.0 1.0 2.0 3.0 4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB12

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 26/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.2m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
		Concrete Surface			
	0.09	FILL Clayey SAND brown to yellow colour, gravels to 10mm, brick fragments, fine to medium grain, loose consistency, dry	No Odour	0	SB12/1_0.09-0.2
	0.45	Sandy CLAY brown colour, medium plasticity, dry, fine grain	No Odour	0	SB12/2_0.45-0.55
	EOH 1.2m bgl		No Odour	0	SB12/3_1.1-1.2

0.0
1.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB13

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 26/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.1m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
	0.09	Concrete Surface			
	0.25	FILL SAND yellow colour, gravels to 10mm, fine to coarse grain, dry, loose consistency	No Odour	0	SB13/1_0.09-0.2
	0.4	FILL Clayey SAND dark brown colour, brick fragments, fine to coarse grain, medium dense consistency, dry	No Odour	0	SB13/2_0.25-0.35
	EOH 1.1m bgl	Sandy CLAY brown colour, medium plasticity, dry, fine to medium grain	No Odour	0	SB13/3_0.4-0.5
			No Odour	0	SB13/4_1.0-1.1

0.0
1.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB14

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 26/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.3m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		~~Ground Surface~~			
		Concrete Surface			
	0.12	FILL SAND yellow to white colour, gravels to 10mm, fine to coarse grain	No Odour	0	SB14/1_0.12-0.22
	0.3	FILL Clayey SAND brown colour, bone fragments, brick fragments, gravels to 15mm, fine to coarse grain, dry	No Odour	0	SB14/2_0.3-0.4
	0.6	Sandy CLAY brown to red brown colour, medium plasticity, dry, fine to medium grain	No Odour	0	SB14/3_0.6-0.7
	EOH 1.3m bgl		No Odour	0	SB14/4_1.2-1.3

0.0
1.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

Mott MacDonald
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

SOIL BOREHOLE LOG SB15

NOT FOR CONSTRUCTION PURPOSES **SHEET 1 of 1**

PROJECT No: 371786

CLIENT: Scope Development Solutions

PROJECT NAME: Kent Town (cont.)

SITE: 25 College Road Kent Town

DRILLING METHOD: Pushtube

SAMPLING METHOD: Grab

DATE: 26/08/2016

LOGGED BY: BB

TOTAL DEPTH: 1.6m bgl

LEGEND	DEPTH (m)	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL
		Ground Surface			
	0.1	FILL Topsoil SAND dark brown colour, fine to coarse grain, plant matter, dry loose consistency	No Odour	0	SB15/1_0.0-0.1
	0.3	FILL SAND yellow colour, gravels to 10mm, fine to coarse grain, dry	No Odour	0	SB15/2_0.1-0.3
	0.85	FILL Clayey SAND dark brown colour, brick fragments, glass fragments, black staining	No Odour	0	SB15/3_0.3-0.4 QC08
	EOH 1.6m bgl	Clayey SAND dark brown colour, dry, fine to medium grain, medium dense consistency	No Odour	0	SB15/4_0.85-0.95
			No Odour	0	SB15/5_1.5-1.6

0.0
1.0
2.0
3.0
4.0

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

	Reviewed By:	FILE

Mott MacDonald Australia
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

Monitoring Well Log SB04/GW1

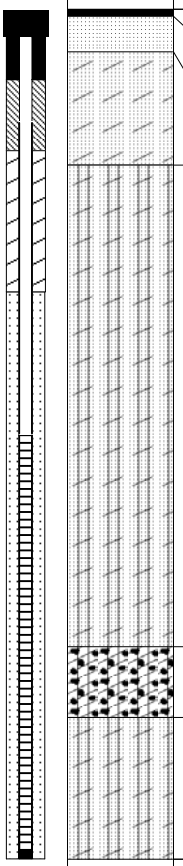
PROJECT No: 371786 | **CLIENT: Scope Development Solutions**

PROJECT NAME: Kent Town | **SITE: 25 College Road Kent Town** | **DRILLING METHOD: Pushtube and augers**

. | **SAMPLING METHOD: Grab**

DATE: 25/8/2016 | **LOGGED BY: BB** | **TOTAL DEPTH: 6m bgl**

PID (ppmv)	ODOUR	SAMPLE LABEL	WATER LEVEL	DESCRIPTION	DEPTH (m)
				~~Ground Surface~~	
0	No Odour	SB04 /1_0.05-0.2		Bitumen Surface	
0	No Odour	SB04 /2_0.3-0.4		FILL SAND yellow white colour, fine to coarse grain, loose consistency, dry, quartzite gravels to 15mm	
				FILL SAND yellow white colour, fine to coarse grain, loose consistency, dry, quartzite gravels to 15mm	
0	No Odour	SB04 /3_1.1-1.2		Sandy CLAY red brown colour, high plasticity, fine to medium grain, dry, firm consistency Initial pushtube soil bore terminated at 1.5m bgl on 25/8/16. Returned later the same day to complete drilling to depth and install well.	
0	No Odour	SB04 /4_4.3-4.4			
0	No Odour	SB04 /5_4.5-4.6		GRAVEL white grey colour sandstone gravels to 10-15mm with sandy CLAY fines as above, dry	
			5.22m bTOC	Sandy CLAY brown colour, fine to medium grain, some gravels as above, dry, becoming wet at 5.5m bgl	
0	No Odour	SB04 /6_5.9-6.0			



NOTES:

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.
NOT FOR CONSTRUCTION PURPOSES

First Occurrence of Groundwater:
Static Groundwater Level: 5.22m bgl

	Reviewed By:	FILE

Mott MacDonald Australia
22 King William St
Adelaide
PO Box 3400
Rundle Mall SA 5000
+61 (0)8 7325 7325

Monitoring Well Log SB07/GW2

PROJECT No: 371786 | **CLIENT: Scope Development Solutions**

PROJECT NAME: Kent Town | **SITE: 25 College Road Kent Town** | **DRILLING METHOD: Pushtube and augers**

. | **SAMPLING METHOD: Grab**

DATE: 25-26/8/2016 | **LOGGED BY: BB** | **TOTAL DEPTH: 7m bgl**

PID (ppmv)	ODOUR	SAMPLE LABEL	WATER LEVEL	DESCRIPTION	DEPTH (m)
				Ground Surface	0
0	No Odour	SB07 /1_0.05-0.2		Bitumen Surface	
0	No Odour	SB07 /2_0.4-0.5		FILL SAND white colour, fine to coarse grain, loose consistency, slightly moist, quartzite gravels to 15mm	
				FILL Clayey SAND dark brown colour, fine to medium grain, medium dense consistency, dry	1
0	No Odour	SB07 /3_1.0-1.1		Sandy CLAY red brown colour, medium plasticity, fine to medium grain, dry Initial pushtube soil bore terminated at 1.5m bgl on 25/8/16. Returned next day 26/8/16 to complete drilling to depth and install well.	2
0	No Odour	SB07 /4_3.0-3.1			3
					4
0	No Odour	SB07 /5_5.0-5.1	4.97m bgl	GRAVEL large sandstone gravels to 20mm with sandy CLAY as above, very moist	5
				Sandy CLAY red brown, medium plasticity, saturated from 6m bgl	6
0	No Odour	SB07 /6_6.9-7.0			7
					8

NOTES:

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.
NOT FOR CONSTRUCTION PURPOSES

First Occurrence of Groundwater:
Static Groundwater Level: 4.97m bgl

	Reviewed By:	FILE

F. Chain of custody documentation and certificates of analysis

AU02_USR_LAB00020

From: Sarah Gould
Sent: Wednesday, 7 September 2016 10:52 AM
To: AU02_USR_LAB00020
Subject: FW: Additional analysis - Kent Town
Attachments: 513565_COC.pdf

Sarah Gould
Phone : +61 3 8564 5053
Email : SarahGould@eurofins.com

From: Lucock, Rebecca K [mailto:Rebecca.Lucock@mottmac.com]
Sent: Wednesday, 7 September 2016 10:48 AM
To: Sarah Gould
Cc: Mary Makarios; Moule, Ashley C
Subject: Additional analysis - Kent Town

Hi Sarah,

Please could I request the following additional analysis for the attached COC?

Vertical delineation:

- SB01/3_1.0-1.1 – HM AU26954(H)
- SB15/4_0.85-0.95 – HM AU270G1(H)
- SB15/4_0.85-0.95 - TRH
- SB11/2_0.8-0.9 – OCP – AU26982(H)
- SB13/3_0.4-0.5 – OCP – AU26995(H)
- SB15/4_0.85-0.95 – OCP
- SB13/3_0.4-0.5 – PAH
- SB15/4_0.85-0.95 – PAH

189 190 (9)

Lateral delineation:

- SB02/2 – HM – AU26956(H)
- SB03/2 – HM, TRH, OCP – AU26935 g 1062
- SB08/3 – PAH, OCP, TRH – AU26976(H)
- SB10/1 – HM, PAH, TRH – AU26941 (g 1062)
- SB12/2 – PAH – AU26992(H)
- SB07/2 – OCP, PAH – AU26971(H)
- SB14/3 - PAH 26997 (H)

Kind regards,

Rebecca

Rebecca Lucock
BEnvSci(Adv)Hons
Senior Environmental Scientist

LIAm
EF/MeT
7/9/16 514709
10.48am

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab

☐ Eurofins | mgt Brisbane Lab

☑ Eurofins | mgt Melbourne Lab

Company	MOTT MACDONALD	Purchase Order		Project Manager	REBECCA LUCOCK
Address	LM 22 KING WILLIAM ST, ADELAIDE, 5000	Eurofins | mgt Quote №		Project №	37186
Contact Name	REBECCA LUCOCK				
Contact Phone №	(08) 7325 7358				
Special Direction	*metals samples not field filtered				
Relinquished by (Signature)	RYAN JUDD				
(Time / Date)	12.00pm 5/9/16				

Project Name	KENT TOWN
Electronic Results Format	
Email for Results	REBECCA.LUCOCK@MOTTMAC.COM
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☑ 5 DAY (Std) ☐ Other ( )

Containers

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Analysis (Note where metals are to be dissolved, please complete "Y" or "Y Filtered")														Sample Comments / DG Hazard Warning
				VIC EPA IWRG 621 (R1)	*metals to be tested for dissolved metals & TDS		dissolved metals (✗) (M18)	total metals (M18)	TPH C6 - C9 + BTEX			1L Plastic	250mL Plastic	175mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar	
1	GW1_5/9/16	5/9	WATER	✓								1	1	2		2	1		~~Extra sample bottles arriving next day~~
2	GW2_5/9/16			✓								1	1	2		2	1		
3	DUP1_5/9/16						✓					1		1					
4	DUP2_5/9/16						✓	(Forward to Envirolab)				1		1					
5	RIN1_5/9/16							✓						1		2	1		
6	TRIP_5/9/16								✓							1			
7																			
8																			
9																			
10																			
11																			
12																			

ENVIROLAB GROUP

Envirolab Services
1a Dalmore Drive
~~Caribbean Park~~
Scoresby VIC 3179
Ph: (03) 9763 2500

Job No: 9238

Date Received: 7/9/16
Time Received: 1:30pm
Received by: BS
Temp: Cool/Ambient 8.6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

514490
Paperwork

Laboratory Use Only							
Received By	Paperwork	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	06/9/16	Time	11.00am	Signature
Received By	C. De Luca Envirolab	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	07/9/16	Time	1.30pm	Signature

Temperature 8.6°C

Report № 9238

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab — Unit F3 Building F 16 Mars Road Lane Cove West NSW 2066 P +61 2 9900 8400 E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab — Unit 1 21 Smallwood Place Murarrie QLD 4172 P +61 7 3902 4600 E EnviroSampleQLD@eurofins.com.au

☑ Eurofins | mgt Melbourne Lab — 2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090 E EnviroSampleVic@eurofins.com.au

Company	MOTT MACDONALD	Purchase Order		Project Manager	REBECCA LUCOCK
Address	LM 22 KING WILLIAM ST, ADELAIDE, 5000	Eurofins | mgt Quote №		Project №	371786
Contact Name	REBECCA LUCOCK				
Contact Phone №	(08) 7325 7358				
Special Direction	*metals samples not field filtered				
Relinquished by	RYAN JUDD				
(Signature)					
(Time / Date)	12.00pm 5/9/16				

Project Name	KENT TOWN	
Electronic Results Format		
Email for Results	REBECCA.LUCOCK@MOTTMAC.COM	
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply	
	☑ 5 DAY (Std.) ☐ Other ( )	

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	VIC EPA IWRG 621 (R1)	*metals to be tested for dissolved metals, & TDS		dissolved metals (M8)	total metals (M18)	TPH C6 - C40 + BTEX				Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL Vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	GW1_5/9/16	5/9	WATER	✓									1	1	2		2	1			~~Extra sample bottles arriving next day~~
2	GW2_5/9/16	↓	↓	✓									1	1	2		2	1			
3	DUP1_5/9/16						✓						1		1						
4	DUP2_5/9/16						✓	(Forward to Envirolab)					1		1						
5	RIN1_5/9/16							✓							1		2	1			
6	TRIP_5/9/16								✓								1				
7																					
8																					
9																					# 514490 Pasquual
10																					
11																					
12																					

Laboratory Use Only								
Received By	Pasquual	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	06/9/16	Time	11.00am	Signature	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab — Unit F3 Building F 16 Mars Road Lane Cove West NSW 2066 P: +61 2 9900 8400 E: EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab — Unit 1 21 Smallwood Place Murarrie QLD 4172 P: +61 7 3902 4600 E: EnviroSampleQLD@eurofins.com.au

☑ Eurofins | mgt Melbourne Lab — 2 Kingston Town Close Oakleigh VIC 3166 P: +61 3 8564 5000 F: +61 3 8564 5090 E: EnviroSampleVic@eurofins.com.au

Company	MOTT MACDONALD	Purchase Order		Project Manager	REBECCA LUCOCK
Address	LM 22 KING WILLIAM ST, ADELAIDE, 5000	Eurofins | mgt Quote №		Project №	371786
Contact Name	REBECCA LUCOCK				
Contact Phone №	(08) 7325 7358				
Special Direction	*metals samples not field filtered				
Relinquished by (Signature)	RYAN JUDD				
(Time / Date)	12.00pm 5/9/16				

Project Name	KENT TOWN
Electronic Results Format	
Email for Results	REBECCA.LUCOCK@MOTTMAC.COM
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☑ 5 DAY (Std.) ☐ Other ( )

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL Vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered"):
- VIC EPA IWRG 621 (R1)
- *metals to be tested for dissolved metals, & TDS
- dissolved metals (~~R~~) (M18)
- total metals (M18)
- TPH C6 - C40 + BTEX

№	Client Sample ID	Date	Matrix	VIC EPA IWRG 621 (R1)	*metals to be tested for dissolved metals, & TDS		dissolved metals (~~R~~) (M18)	total metals (M18)	TPH C6 - C40 + BTEX										Sample Comments / DG Hazard Warning
1	GW1_5/9/16	5/9	WATER	✓									1	1	2		2	1	~~Extra sample bottles arriving next day~~
2	GW2_5/9/16	↓	↓	✓									1	1	2		2	1	
3	DUP1_5/9/16						✓						1		1				
4	DUP2_5/9/16						✓	(Forward to Envirolab)					1		1				
5	RIN1_5/9/16							✓							1		2	1	
6	TRIP_5/9/16								✓								1		
7																			
8																			
9																			#514490
10																			Paperwork
11																			
12																			

Laboratory Use Only								
Received By	Paperwork	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	06/9/16	Time	11.00am	Signature	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

1 Dalmore Drive, Scoresby, Victoria 3179
tel: +61 3 9763 2500

email: melbourne@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Melbourne | ABN 37 112 535 645 - 002

CERTIFICATE OF ANALYSIS 9238

Client:
Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

Attention: Rebecca Lucock

Sample log in details:

Your Reference:	**371786 - Kent Town**
No. of samples:	1 Water
Date samples received / completed instructions received	07/09/2016 / 07/09/2016

This report supersedes 9238_R00 due to a transcription error with the mercury result.

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	14/09/16 / 14/09/16
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

Chris De Luca
Senior Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

All metals in water-dissolved		
Our Reference:	UNITS	9238-1
Your Reference	----------	DUP2_5/9/16
Date Sampled	----------	05/09/2016
Type of sample		Water
Date prepared	-	07/09/2016
Date analysed	-	07/09/2016
Antimony-Dissolved	µg/L	<1
Arsenic-Dissolved	µg/L	<1
Beryllium-Dissolved	µg/L	<0.5
Boron-Dissolved	µg/L	200
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Cobalt-Dissolved	µg/L	6
Copper-Dissolved	µg/L	1
Lead-Dissolved	µg/L	<1
Manganese-Dissolved	µg/L	55
Mercury-Dissolved	µg/L	<0.05
Molybdenum-Dissolved	µg/L	2
Nickel-Dissolved	µg/L	4
Selenium-Dissolved	µg/L	1
Silver-Dissolved	µg/L	<1
Tin-Dissolved	µg/L	<1
Vanadium-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	1

Method ID	Methodology Summary
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

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QUALITY CONTROL All metals in water-dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			07/09/2016	[NT]	[NT]	LCS-1	07/09/2016
Date analysed	-			07/09/2016	[NT]	[NT]	LCS-1	07/09/2016
Antimony-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	118%
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	105%
Beryllium-Dissolved	µg/L	0.5	Metals-022 ICP-MS	<0.5	[NT]	[NT]	LCS-1	100%
Boron-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-1	101%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	LCS-1	107%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	107%
Cobalt-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	106%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	106%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	104%
Manganese-Dissolved	µg/L	5	Metals-022 ICP-MS	<5	[NT]	[NT]	LCS-1	108%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	LCS-1	116%
Molybdenum-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	107%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	106%
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	105%
Silver-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	107%
Tin-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	114%
Vanadium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	105%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	LCS-1	105%

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Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

eurofins | mgt

Certificate of Analysis

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **- Rebecca Lucock**

Report **514490-W-V2**
Project name KENT TOWN
Project ID 371786
Received Date Sep 07, 2016

Client Sample ID			**GW1_5/9/16**	**GW2_5/9/16**	**DUP1_5/9/16**	**RIN1_5/9/16**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**A16-Se04110**	**A16-Se04111**	**A16-Se04112**	**A16-Se04113**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	-	-
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	-	-
Volatile Organics						
1.2.4-Trichlorobenzene	0.02	mg/L	< 0.02	< 0.02	-	-
Hexachlorobutadiene	0.02	mg/L	< 0.02	< 0.02	-	-
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	-	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	-	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	-	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	-	-
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	-	-
Benzene	0.001	mg/L	< 0.001	< 0.001	-	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	-	-
Bromomethane	0.001	mg/L	< 0.001	< 0.001	-	-

Client Sample ID			GW1_5/9/16	GW2_5/9/16	DUP1_5/9/16	RIN1_5/9/16
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			A16-Se04110	A16-Se04111	A16-Se04112	A16-Se04113
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Volatile Organics						
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	-	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	-	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	-	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	-	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	-	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	-	-
Styrene	0.001	mg/L	< 0.001	< 0.001	-	-
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
Toluene	0.001	mg/L	< 0.001	< 0.001	-	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-	-
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	-	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	-	-
Fluorobenzene (surr.)	1	%	103	89	-	-
4-Bromofluorobenzene (surr.)	1	%	99	95	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	-	-
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	-	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	< 0.001	-	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Naphthalene	0.001	mg/L	< 0.001	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	-	-

Client Sample ID			GW1_5/9/16	GW2_5/9/16	DUP1_5/9/16	RIN1_5/9/16
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**A16-Se04110**	**A16-Se04111**	**A16-Se04112**	**A16-Se04113**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	57	58	-	-
p-Terphenyl-d14 (surr.)	1	%	50	61	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	-	-
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	-	-
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	-	-
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	-	-
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	-	-
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-	-
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endrin aldehyde	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	-	-
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Toxaphene	0.01	mg/L	< 0.01	< 0.01	-	-
Dibutylchlorendate (surr.)	1	%	95	78	-	-
Tetrachloro-m-xylene (surr.)	1	%	124	76	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1232	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1242	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1248	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1254	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1260	0.001	mg/L	< 0.001	< 0.001	-	-
Total PCB*	0.001	mg/L	<0.001	<0.001	-	-
Dibutylchlorendate (surr.)	1	%	95	78	-	-
Tetrachloro-m-xylene (surr.)	1	%	124	76	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.003	mg/L	< 0.003	< 0.003	-	-
2.4-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	-	-
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	-	-
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	-	-
2.6-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	-	-
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01	< 0.01	-	-
Pentachlorophenol	0.01	mg/L	< 0.01	< 0.01	-	-
Tetrachlorophenols - Total	0.03	mg/L	< 0.03	< 0.03	-	-
Total Halogenated Phenol*	0.01	mg/L	< 0.01	< 0.01	-	-

Client Sample ID			GW1_5/9/16	GW2_5/9/16	DUP1_5/9/16	RIN1_5/9/16
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			A16-Se04110	A16-Se04111	A16-Se04112	A16-Se04113
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1	< 0.1	-	-
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03	< 0.03	-	-
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003	< 0.003	-	-
2-Nitrophenol	0.01	mg/L	< 0.01	< 0.01	-	-
2.4-Dimethylphenol	0.003	mg/L	< 0.003	< 0.003	-	-
2.4-Dinitrophenol	0.03	mg/L	< 0.03	< 0.03	-	-
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006	< 0.006	-	-
4-Nitrophenol	0.03	mg/L	< 0.03	< 0.03	-	-
Dinoseb	0.1	mg/L	< 0.1	< 0.1	-	-
Phenol	0.003	mg/L	< 0.003	< 0.003	-	-
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1	< 0.1	-	-
Phenol-d6 (surr.)	1	%	37	38	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	-	-
Chromium (hexavalent)	0.001	mg/L	< 0.001	< 0.001	-	-
Cyanide (total)	0.005	mg/L	< 0.005	< 0.005	-	-
Fluoride	0.5	mg/L	< 0.5	< 0.5	-	-
pH	0.1	pH Units	7.6	7.4	-	-
Total Dissolved Solids	10	mg/L	1300	1500	-	-
Heavy Metals						
Antimony	0.005	mg/L	-	-	-	< 0.005
Antimony (filtered)	0.005	mg/L	-	-	< 0.005	-
Arsenic	0.001	mg/L	-	-	-	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Beryllium	0.001	mg/L	-	-	-	< 0.001
Beryllium (filtered)	0.001	mg/L	-	-	< 0.001	-
Boron	0.05	mg/L	-	-	-	< 0.05
Boron (filtered)	0.05	mg/L	-	-	0.20	-
Cadmium	0.0002	mg/L	-	-	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Chromium	0.001	mg/L	-	-	-	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Cobalt	0.001	mg/L	-	-	-	< 0.001
Cobalt (filtered)	0.001	mg/L	-	-	0.006	-
Copper	0.001	mg/L	-	-	-	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.001	0.002	-
Lead	0.001	mg/L	-	-	-	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Manganese	0.005	mg/L	-	-	-	< 0.005
Manganese (filtered)	0.005	mg/L	-	-	0.047	-
Mercury	0.0001	mg/L	-	-	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	-
Molybdenum	0.005	mg/L	-	-	-	< 0.005
Molybdenum (filtered)	0.005	mg/L	0.025	< 0.005	< 0.005	-
Nickel	0.001	mg/L	-	-	-	< 0.001
Nickel (filtered)	0.001	mg/L	0.004	0.004	0.005	-

Client Sample ID			GW1_5/9/16	GW2_5/9/16	DUP1_5/9/16	RIN1_5/9/16
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**A16-Se04110**	**A16-Se04111**	**A16-Se04112**	**A16-Se04113**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Selenium	0.001	mg/L	-	-	-	< 0.001
Selenium (filtered)	0.001	mg/L	0.001	0.002	0.002	-
Silver	0.005	mg/L	-	-	-	< 0.005
Silver (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Tin	0.005	mg/L	-	-	-	< 0.005
Tin (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Vanadium	0.005	mg/L	-	-	-	< 0.005
Vanadium (filtered)	0.005	mg/L	-	-	< 0.005	-
Zinc	0.005	mg/L	-	-	-	< 0.005
Zinc (filtered)	0.001	mg/L	0.001	0.001	0.001	-

Client Sample ID			TRIP_5/9/16
Sample Matrix			**Water**
Eurofins | mgt Sample No.			**A16-Se04114**
Date Sampled			**Sep 05, 2016**
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	145
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH C6-C10	0.02	mg/L	< 0.02

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 07, 2016	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Volatile Organics	Melbourne	Sep 07, 2016	7 Days
- Method: USEPA 8260 - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 07, 2016	7 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Sep 07, 2016	7 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Polychlorinated Biphenyls	Melbourne	Sep 07, 2016	7 Days
- Method: USEPA 8082 Polychlorinated Biphenyls			
Phenols (Halogenated)	Melbourne	Sep 07, 2016	7 Day
- Method: USEPA 8270 Phenols			
Phenols (non-Halogenated)	Melbourne	Sep 07, 2016	7 Day
- Method: USEPA 8270 Phenols			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Chromium (hexavalent)	Melbourne	Sep 07, 2016	28 Day
- Method: Cr (VI) by MGT 1170A			
Cyanide (total)	Melbourne	Sep 07, 2016	14 Day
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride	Melbourne	Sep 07, 2016	28 Day
- Method: LM-LTM-INO-4300 (Fluoride by Ion Chromatography)			
pH	Melbourne	Sep 07, 2016	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
IWRG 621 Metals : Metals M12 filtered	Melbourne	Sep 07, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
BTEX	Melbourne	Sep 07, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Dissolved Solids	Melbourne	Sep 07, 2016	7 Day
- Method: LM-LTM-INO-4110 (Total Dissolved Solids @ 178°C - 182°C)			
Metals M18	Melbourne	Sep 07, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Metals M18 filtered	Melbourne	Sep 07, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Phone: 08 7325 7325
Fax:

Received: Sep 7, 2016 12:13 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Total Dissolved Solids	TRH C6-C10	BTEX	Metals M18	Metals M18 filtered	Vic EPA IWRG 621 (Filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	GW1_5/9/16	Sep 05, 2016		Water	A16-Se04110	X					X
2	GW2_5/9/16	Sep 05, 2016		Water	A16-Se04111	X					X
3	DUP1_5/9/16	Sep 05, 2016		Water	A16-Se04112					X	
4	RIN1_5/9/16	Sep 05, 2016		Water	A16-Se04113				X		
5	TRIP_5/9/16	Sep 05, 2016		Water	A16-Se04114		X	X			
Test Counts						2	1	1	1	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Volatile Organics							
1.2.4-Trichlorobenzene	mg/L	< 0.02			0.02	Pass	
Hexachlorobutadiene	mg/L	< 0.02			0.02	Pass	
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	<0.001			0.001	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Chromium (hexavalent)	mg/L	< 0.001			0.001	Pass	
Cyanide (total)	mg/L	< 0.005			0.005	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Total Dissolved Solids	mg/L	< 10			10	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Antimony	mg/L	< 0.005			0.005	Pass	
Antimony (filtered)	mg/L	< 0.005			0.005	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Beryllium	mg/L	< 0.001			0.001	Pass	
Beryllium (filtered)	mg/L	< 0.001			0.001	Pass	
Boron	mg/L	< 0.05			0.05	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Molybdenum	mg/L	< 0.005			0.005	Pass	
Molybdenum (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Silver	mg/L	< 0.005			0.005	Pass	
Silver (filtered)	mg/L	< 0.005			0.005	Pass	
Tin	mg/L	< 0.005			0.005	Pass	
Tin (filtered)	mg/L	< 0.005			0.005	Pass	
Vanadium	mg/L	< 0.005			0.005	Pass	
Vanadium (filtered)	mg/L	< 0.005			0.005	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	85			70-130	Pass	
TRH C10-C14	%	88			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	84			70-130	Pass	
Toluene	%	83			70-130	Pass	
Ethylbenzene	%	85			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Xylenes - Total	%	88			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	78			70-130	Pass	
LCS - % Recovery							
Volatile Organics							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.1-Dichloroethene	%	85			70-130	Pass	
1.1.1-Trichloroethane	%	107			70-130	Pass	
1.2-Dichlorobenzene	%	104			70-130	Pass	
1.2-Dichloroethane	%	98			70-130	Pass	
Trichloroethene	%	82			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	73			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	124			70-130	Pass	
Acenaphthylene	%	125			70-130	Pass	
Anthracene	%	127			70-130	Pass	
Benz(a)anthracene	%	94			70-130	Pass	
Benzo(a)pyrene	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	%	91			70-130	Pass	
Benzo(g.h.i)perylene	%	105			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	115			70-130	Pass	
Dibenz(a.h)anthracene	%	102			70-130	Pass	
Fluoranthene	%	118			70-130	Pass	
Fluorene	%	122			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	113			70-130	Pass	
Naphthalene	%	101			70-130	Pass	
Phenanthrene	%	126			70-130	Pass	
Pyrene	%	124			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	74			70-130	Pass	
4.4'-DDE	%	92			70-130	Pass	
4.4'-DDT	%	74			70-130	Pass	
a-BHC	%	95			70-130	Pass	
Aldrin	%	86			70-130	Pass	
b-BHC	%	89			70-130	Pass	
d-BHC	%	90			70-130	Pass	
Dieldrin	%	130			70-130	Pass	
Endosulfan I	%	103			70-130	Pass	
Endosulfan II	%	94			70-130	Pass	
Endosulfan sulphate	%	78			70-130	Pass	
Endrin	%	105			70-130	Pass	
Endrin aldehyde	%	70			70-130	Pass	
Endrin ketone	%	75			70-130	Pass	
g-BHC (Lindane)	%	99			70-130	Pass	
Heptachlor	%	73			70-130	Pass	
Heptachlor epoxide	%	83			70-130	Pass	
Hexachlorobenzene	%	95			70-130	Pass	
Methoxychlor	%	102			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	125			30-130	Pass	
2.4-Dichlorophenol	%	92			30-130	Pass	
2.4.5-Trichlorophenol	%	96			30-130	Pass	
2.4.6-Trichlorophenol	%	94			30-130	Pass	
2.6-Dichlorophenol	%	125			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4-Chloro-3-methylphenol	%	96			30-130	Pass	
Pentachlorophenol	%	97			30-130	Pass	
Tetrachlorophenols - Total	%	92			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	123			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	102			30-130	Pass	
2-Methylphenol (o-Cresol)	%	86			30-130	Pass	
2-Nitrophenol	%	92			30-130	Pass	
2.4-Dimethylphenol	%	88			30-130	Pass	
2.4-Dinitrophenol	%	95			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	116			30-130	Pass	
4-Nitrophenol	%	69			30-130	Pass	
Dinoseb	%	101			30-130	Pass	
Phenol	%	77			30-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	96			70-130	Pass	
Cyanide (total)	%	101			70-130	Pass	
Fluoride	%	101			70-130	Pass	
Total Dissolved Solids	%	98			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	81			80-120	Pass	
Arsenic	%	91			80-120	Pass	
Arsenic (filtered)	%	91			80-120	Pass	
Beryllium	%	100			80-120	Pass	
Boron	%	96			80-120	Pass	
Boron (filtered)	%	96			80-120	Pass	
Cadmium	%	95			80-120	Pass	
Cadmium (filtered)	%	95			80-120	Pass	
Chromium	%	91			80-120	Pass	
Chromium (filtered)	%	91			80-120	Pass	
Cobalt	%	91			80-120	Pass	
Cobalt (filtered)	%	91			80-120	Pass	
Copper	%	91			80-120	Pass	
Copper (filtered)	%	91			80-120	Pass	
Lead	%	92			80-120	Pass	
Lead (filtered)	%	92			80-120	Pass	
Manganese	%	91			80-120	Pass	
Manganese (filtered)	%	91			80-120	Pass	
Mercury	%	86			75-125	Pass	
Mercury (filtered)	%	86			70-130	Pass	
Molybdenum	%	92			80-120	Pass	
Molybdenum (filtered)	%	92			80-120	Pass	
Nickel	%	91			80-120	Pass	
Nickel (filtered)	%	91			80-120	Pass	
Selenium	%	91			80-120	Pass	
Selenium (filtered)	%	91			80-120	Pass	
Silver	%	81			80-120	Pass	
Tin	%	90			80-120	Pass	
Tin (filtered)	%	90			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Vanadium			%	94			80-120	Pass	
Zinc			%	92			80-120	Pass	
Zinc (filtered)			%	92			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	B16-Se04711	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M16-Se05355	NCP	%	124			70-130	Pass	
Acenaphthylene	M16-Se05355	NCP	%	126			70-130	Pass	
Anthracene	M16-Se05355	NCP	%	130			70-130	Pass	
Benz(a)anthracene	M16-Se05355	NCP	%	108			70-130	Pass	
Benzo(a)pyrene	M16-Se05355	NCP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	M16-Se05355	NCP	%	90			70-130	Pass	
Benzo(g.h.i)perylene	M16-Se05355	NCP	%	108			70-130	Pass	
Benzo(k)fluoranthene	M16-Se05355	NCP	%	82			70-130	Pass	
Chrysene	M16-Se05355	NCP	%	126			70-130	Pass	
Dibenz(a.h)anthracene	M16-Se05355	NCP	%	113			70-130	Pass	
Fluoranthene	M16-Se05355	NCP	%	119			70-130	Pass	
Fluorene	M16-Se05355	NCP	%	123			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se05355	NCP	%	120			70-130	Pass	
Naphthalene	M16-Se05355	NCP	%	106			70-130	Pass	
Phenanthrene	M16-Se05355	NCP	%	129			70-130	Pass	
Pyrene	M16-Se05355	NCP	%	125			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M16-Se05499	NCP	%	72			70-130	Pass	
4.4'-DDE	M16-Se05499	NCP	%	91			70-130	Pass	
4.4'-DDT	M16-Se05365	NCP	%	78			70-130	Pass	
a-BHC	M16-Se05499	NCP	%	103			70-130	Pass	
Aldrin	M16-Se05499	NCP	%	93			70-130	Pass	
b-BHC	M16-Se05499	NCP	%	91			70-130	Pass	
d-BHC	M16-Se05499	NCP	%	92			70-130	Pass	
Dieldrin	M16-Se05499	NCP	%	112			70-130	Pass	
Endosulfan I	M16-Se05499	NCP	%	95			70-130	Pass	
Endosulfan II	M16-Se05499	NCP	%	108			70-130	Pass	
Endosulfan sulphate	M16-Se05499	NCP	%	83			70-130	Pass	
Endrin	M16-Se05499	NCP	%	129			70-130	Pass	
Endrin aldehyde	M16-Se05499	NCP	%	81			70-130	Pass	
Endrin ketone	M16-Se05499	NCP	%	89			70-130	Pass	
g-BHC (Lindane)	M16-Se05499	NCP	%	104			70-130	Pass	
Heptachlor	M16-Se05499	NCP	%	72			70-130	Pass	
Heptachlor epoxide	M16-Se05365	NCP	%	75			70-130	Pass	
Hexachlorobenzene	M16-Se05499	NCP	%	119			70-130	Pass	
Methoxychlor	M16-Se05499	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M16-Se05355	NCP	%	116			30-130	Pass	
2.4-Dichlorophenol	M16-Se05355	NCP	%	88			30-130	Pass	
2.4.5-Trichlorophenol	M16-Se05355	NCP	%	94			30-130	Pass	
2.4.6-Trichlorophenol	M16-Se05355	NCP	%	84			30-130	Pass	
2.6-Dichlorophenol	M16-Se05355	NCP	%	119			30-130	Pass	
4-Chloro-3-methylphenol	M16-Se05355	NCP	%	92			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pentachlorophenol	M16-Se05355	NCP	%	89			30-130	Pass	
Tetrachlorophenols - Total	M16-Se05355	NCP	%	86			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M16-Se05355	NCP	%	117			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M16-Se05355	NCP	%	93			30-130	Pass	
2-Methylphenol (o-Cresol)	M16-Se05355	NCP	%	85			30-130	Pass	
2-Nitrophenol	M16-Se05355	NCP	%	85			30-130	Pass	
2.4-Dimethylphenol	M16-Se05355	NCP	%	84			30-130	Pass	
2.4-Dinitrophenol	M16-Se05355	NCP	%	72			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M16-Se05355	NCP	%	128			30-130	Pass	
4-Nitrophenol	M16-Se05355	NCP	%	80			30-130	Pass	
Dinoseb	M16-Se05355	NCP	%	89			30-130	Pass	
Phenol	M16-Se05355	NCP	%	100			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B16-Se04711	NCP	%	76			70-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	A16-Se04110	CP	%	97			70-130	Pass	
Fluoride	S16-Se00356	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony (filtered)	A16-Se04110	CP	%	99			75-125	Pass	
Arsenic (filtered)	A16-Se04110	CP	%	94			70-130	Pass	
Beryllium (filtered)	A16-Se04110	CP	%	105			75-125	Pass	
Cadmium (filtered)	A16-Se04110	CP	%	91			70-130	Pass	
Chromium (filtered)	A16-Se04110	CP	%	90			70-130	Pass	
Cobalt (filtered)	A16-Se04110	CP	%	86			75-125	Pass	
Copper (filtered)	A16-Se04110	CP	%	86			70-130	Pass	
Lead (filtered)	A16-Se04110	CP	%	88			70-130	Pass	
Mercury (filtered)	A16-Se04110	CP	%	106			70-130	Pass	
Molybdenum (filtered)	A16-Se04110	CP	%	90			75-125	Pass	
Nickel (filtered)	A16-Se04110	CP	%	87			70-130	Pass	
Selenium (filtered)	A16-Se04110	CP	%	101			70-130	Pass	
Silver (filtered)	S16-Se06471	NCP	%	88			75-125	Pass	
Tin (filtered)	A16-Se04110	CP	%	88			75-125	Pass	
Vanadium (filtered)	A16-Se04110	CP	%	94			75-125	Pass	
Zinc (filtered)	A16-Se04110	CP	%	88			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony (filtered)	S16-Se06471	NCP	%	83			75-125	Pass	
Beryllium (filtered)	M16-Se07162	NCP	%	101			75-125	Pass	
Cobalt (filtered)	M16-Se07162	NCP	%	80			75-125	Pass	
Manganese (filtered)	M16-Se06455	NCP	%	80			70-130	Pass	
Vanadium (filtered)	M16-Se07162	NCP	%	89			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Boron	M16-Se06505	NCP	%	75			75-125	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B16-Se00767	NCP	%	90			70-130	Pass	
Toluene	B16-Se00767	NCP	%	100			70-130	Pass	
Ethylbenzene	B16-Se00767	NCP	%	113			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	B16-Se00767	NCP	%	115			70-130	Pass	
o-Xylene	B16-Se00767	NCP	%	114			70-130	Pass	
Xylenes - Total	B16-Se00767	NCP	%	115			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B16-Se00767	NCP	%	106			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	B16-Se04577	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	B16-Se04577	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	B16-Se04577	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M16-Se05354	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
a-BHC	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	M16-Se05498	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Toxaphene	M16-Se05498	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1221	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1232	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1242	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1248	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1254	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1260	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total PCB*	M16-Se05498	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M16-Se05354	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dichlorophenol	M16-Se05354	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4.5-Trichlorophenol	M16-Se05354	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	M16-Se05354	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	M16-Se05354	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
4-Chloro-3-methylphenol	M16-Se05354	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pentachlorophenol	M16-Se05354	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Tetrachlorophenols - Total	M16-Se05354	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M16-Se05354	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M16-Se05354	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M16-Se05354	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Nitrophenol	M16-Se05354	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dimethylphenol	M16-Se05354	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	M16-Se05354	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M16-Se05354	NCP	mg/L	< 0.006	< 0.006	<1	30%	Pass	
4-Nitrophenol	M16-Se05354	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Dinoseb	M16-Se05354	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Phenol	M16-Se05354	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B16-Se04577	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	B16-Se04577	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	B16-Se04577	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	A16-Se04110	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cyanide (total)	A16-Se04110	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Fluoride	S16-Se00356	NCP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
pH	M16-Se05161	NCP	pH Units	7.4	7.4	pass	30%	Pass	
Total Dissolved Solids	M16-Se05371	NCP	mg/L	310	310	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony (filtered)	A16-Se04110	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Arsenic (filtered)	A16-Se04110	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Beryllium (filtered)	A16-Se04110	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	A16-Se04110	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	A16-Se04110	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	A16-Se04110	CP	mg/L	0.014	0.014	<1	30%	Pass	
Copper (filtered)	A16-Se04110	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	A16-Se04110	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	A16-Se04110	CP	mg/L	1.3	1.3	<1	30%	Pass	
Mercury (filtered)	A16-Se04110	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Molybdenum (filtered)	A16-Se04110	CP	mg/L	0.025	0.026	1.0	30%	Pass	
Nickel (filtered)	A16-Se04110	CP	mg/L	0.004	0.004	4.0	30%	Pass	
Selenium (filtered)	A16-Se04110	CP	mg/L	0.001	< 0.001	19	30%	Pass	
Silver (filtered)	A16-Se04110	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Tin (filtered)	A16-Se04110	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Vanadium (filtered)	A16-Se04110	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	A16-Se04110	CP	mg/L	0.001	0.001	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony (filtered)	M16-Se07162	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Beryllium (filtered)	M16-Se07162	NCP	mg/L	0.002	0.003	5.0	30%	Pass	
Cobalt (filtered)	M16-Se07162	NCP	mg/L	0.017	0.017	<1	30%	Pass	
Manganese (filtered)	M16-Se07162	NCP	mg/L	1.0	1.0	<1	30%	Pass	
Vanadium (filtered)	M16-Se07162	NCP	mg/L	0.007	0.007	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Boron	M16-Se06505	NCP	mg/L	3.5	3.6	2.0	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B16-Se00572	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	B16-Se00572	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	B16-Se00572	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	B16-Se00572	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	B16-Se00572	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	B16-Se00572	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C10	B16-Se00572	NCP	mg/L	0.04	0.04	9.0	30%	Pass	

Comments

V2 - corrected acetone result for sample GW1_5/9/16 (Se04110).

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **- Rebecca Lucock**

Report **515606-S**
Project name KENT TOWN
Project ID 371768
Received Date Sep 13, 2016

Client Sample ID			**SB10/2_1.1-1.2**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M16-Se12417**
Date Sampled			**Aug 25, 2016**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90
p-Terphenyl-d14 (surr.)	1	%	100

Client Sample ID			SB10/2_1.1-1.2
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M16-Se12417**
Date Sampled			**Aug 25, 2016**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
% Moisture	1	%	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 14, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 14, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 14, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 14, 2016	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
% Moisture	Melbourne	Sep 13, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Mott MacDonald	**Order No.:**		**Received:**	Sep 13, 2016 2:36 PM
Address:	Mezzanine Level, 22 King William St Adelaide SA 5000	**Report #:**	515606	**Due:**	Sep 20, 2016
		Phone:	08 7325 7325	**Priority:**	5 Day
		Fax:		**Contact Name:**	- Rebecca Lucock
Project Name:	KENT TOWN				
Project ID:	371768				

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Benzo(a)pyrene	Lead	Reverse HOLD Charge	Zinc	Polycyclic Aromatic Hydrocarbons	AUS Leaching Procedure	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	SB01/2_0.6-0.7	Aug 25, 2016		AUS Leachate	M16-Se12415		X		X		X		
2	SB10/1_0.1-0.2	Aug 25, 2016		AUS Leachate	M16-Se12416	X					X		
3	SB10/2_1.1-1.2	Aug 25, 2016		Soil	M16-Se12417			X		X		X	X
Test Counts						1	1	1	1	1	2	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	110			70-130	Pass	
TRH C10-C14	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	126			70-130	Pass	
TRH C6-C10	%	101			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	107			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	85			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	95			70-130	Pass	
Benzo(g.h.i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	101			70-130	Pass	
Chrysene	%	98			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene			%	81			70-130	Pass	
Fluoranthene			%	119			70-130	Pass	
Fluorene			%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	80			70-130	Pass	
Naphthalene			%	102			70-130	Pass	
Phenanthrene			%	88			70-130	Pass	
Pyrene			%	115			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
TRH >C10-C16			%	99			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M16-Se16952	NCP	%	89			70-130	Pass	
TRH C10-C14	A16-Se15731	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M16-Se16952	NCP	%	101			70-130	Pass	
TRH C6-C10	M16-Se16952	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B16-Se12252	NCP	%	81			70-130	Pass	
Acenaphthylene	B16-Se12252	NCP	%	92			70-130	Pass	
Anthracene	B16-Se12252	NCP	%	92			70-130	Pass	
Benz(a)anthracene	B16-Se12252	NCP	%	73			70-130	Pass	
Benzo(a)pyrene	B16-Se12252	NCP	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	B16-Se12252	NCP	%	94			70-130	Pass	
Benzo(g.h.i)perylene	B16-Se12252	NCP	%	86			70-130	Pass	
Benzo(k)fluoranthene	B16-Se12252	NCP	%	106			70-130	Pass	
Chrysene	B16-Se12252	NCP	%	82			70-130	Pass	
Dibenz(a.h)anthracene	B16-Se12252	NCP	%	77			70-130	Pass	
Fluoranthene	B16-Se12252	NCP	%	105			70-130	Pass	
Fluorene	B16-Se12252	NCP	%	83			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B16-Se12252	NCP	%	80			70-130	Pass	
Naphthalene	B16-Se12252	NCP	%	86			70-130	Pass	
Phenanthrene	B16-Se12252	NCP	%	75			70-130	Pass	
Pyrene	B16-Se12252	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	A16-Se15731	NCP	%	108			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M16-Se16873	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M16-Se12239	NCP	mg/kg	590	600	2.0	30%	Pass	
TRH C15-C28	M16-Se12239	NCP	mg/kg	10000	10000	2.0	30%	Pass	
TRH C29-C36	M16-Se12239	NCP	mg/kg	2600	2400	7.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M16-Se16873	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M16-Se16873	NCP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B16-Se12251	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M16-Se12239	NCP	mg/kg	1500	1600	3.0	30%	Pass	
TRH >C16-C34	M16-Se12239	NCP	mg/kg	11000	11000	<1	30%	Pass	
TRH >C34-C40	M16-Se12239	NCP	mg/kg	500	460	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M16-Se12484	NCP	%	23	21	6.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **- Rebecca Lucock**

Report **515606-L**
Project name KENT TOWN
Project ID 371768
Received Date Sep 13, 2016

Client Sample ID			**SB01/2_0.6-0.7**	**SB10/1_0.1-0.2**
Sample Matrix			**AUS Leachate**	**AUS Leachate**
Eurofins | mgt Sample No.			**M16-Se12415**	**M16-Se12416**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene	0.001	mg/L	-	< 0.001
Heavy Metals				
Lead	0.01	mg/L	1.4	-
Zinc	0.01	mg/L	220	-
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	1.0	1.0
pH (initial)	0.1	pH Units	6.6	6.8
pH (Leachate fluid)	0.1	pH Units	5.0	5.0
pH (off)	0.1	pH Units	5.5	5.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 15, 2016	7 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Heavy Metals	Melbourne	Sep 14, 2016	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
AUS Leaching Procedure	Melbourne	Sep 14, 2016	7 Day
- Method: LTM-GEN-7010			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Mott MacDonald	**Order No.:**		**Received:**	Sep 13, 2016 2:36 PM
Address:	Mezzanine Level, 22 King William St Adelaide SA 5000	**Report #:**	515606	**Due:**	Sep 20, 2016
		Phone:	08 7325 7325	**Priority:**	5 Day
		Fax:		**Contact Name:**	- Rebecca Lucock
Project Name:	KENT TOWN				
Project ID:	371768				

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Benzo(a)pyrene	Lead	Reverse HOLD Charge	Zinc	Polycyclic Aromatic Hydrocarbons	AUS Leaching Procedure	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217													
Brisbane Laboratory - NATA Site # 20794													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	SB01/2_0.6-0.7	Aug 25, 2016		AUS Leachate	M16-Se12415		X		X		X		
2	SB10/1_0.1-0.2	Aug 25, 2016		AUS Leachate	M16-Se12416	X					X		
3	SB10/2_1.1-1.2	Aug 25, 2016		Soil	M16-Se12417			X		X		X	X
Test Counts						1	1	1	1	1	2	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	M16-Se12727	NCP	%	91			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Benzo(a)pyrene	M16-Se12837	NCP	%	95			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M16-Se12727	NCP	mg/L	0.07	0.07	4.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	M16-Se12836	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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AU02_USR_LAB00020

From: Sarah Gould
Sent: Tuesday, 13 September 2016 2:36 PM
To: AU02_USR_LAB00020 513585
Subject: FW: Eurofins | mgt Test Results, Invoice - Report 514709 : Site KENT TOWN (371768)

Sarah Gould
Phone : +61 3 8564 5053
Email : SarahGould@eurofins.com

-----Original Message-----
From: Lucock, Rebecca K [mailto:Rebecca.Lucock@mottmac.com]
Sent: Tuesday, 13 September 2016 2:36 PM
To: Sarah Gould
Subject: RE: Eurofins | mgt Test Results, Invoice - Report 514709 : Site KENT TOWN (371768)

Hi Sarah,

Thank you. Please could you test sample 'SB10/2' for PAH and TRH? AV 26980 (1+)

Plus, please could you do ASLP leachability on the following samples:

'SB01/2' - lead & zinc AV 26933
'SB10/1' - BaP AV 26941

1062

Thanks,

Bec

Jimmy
515606

Rebecca Lucock
BEnvSci(Adv)Hons

Senior Environmental Scientist

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tel: +61 3 9763 2500

email: melbourne@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Melbourne | ABN 37 112 535 645 - 002

CERTIFICATE OF ANALYSIS 9180

Client:
Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

Attention: Ashley Moule

Sample log in details:

Your Reference:	**371768 Kent Town**		
No. of samples:	1 soil		
Date samples received / completed instructions received	30/08/2016	/	30/08/2016

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	6/09/16	/	1/09/16
Date of Preliminary Report:	Not Issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

Pamela Adams
Laboratory Manager

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Acid Extractable metals in soil		
Our Reference:	UNITS	9180-1
Your Reference	----------	QC08_26/8/2016
Date Sampled	----------	26/08/2016
Type of sample		Soil
Date digested	-	31/08/2016
Date analysed	-	31/08/2016
Arsenic	mg/kg	6
Silver	mg/kg	<1
Beryllium	mg/kg	<1
Boron	mg/kg	8
Cadmium	mg/kg	0.4
Chromium	mg/kg	18
Cobalt	mg/kg	9
Copper	mg/kg	84
Mercury	mg/kg	0.5
Manganese	mg/kg	370
Molybdenum	mg/kg	<1
Nickel	mg/kg	10
Lead	mg/kg	230
Antimony	mg/kg	<7
Selenium	mg/kg	<2
Tin	mg/kg	16
Vanadium	mg/kg	20
Zinc	mg/kg	430

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Moisture		
Our Reference:	UNITS	9180-1
Your Reference	----------	QC08_26/8/2016
Date Sampled	----------	26/08/2016
Type of sample		Soil
Date prepared	-	31/08/2016
Date analysed	-	01/09/2016
Moisture	%	12

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Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 12 hours.

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QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			31/08/2016	[NT]	[NT]	LCS-1	31/08/2016
Date analysed	-			31/08/2016	[NT]	[NT]	LCS-1	31/08/2016
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	102%
Silver	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	90%
Beryllium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	120%
Boron	mg/kg	3	Metals-020 ICP-AES	<3	[NT]	[NT]	LCS-1	110%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-1	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	106%
Cobalt	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	101%
Manganese	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	109%
Molybdenum	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	108%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	108%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	106%
Antimony	mg/kg	7	Metals-020 ICP-AES	<7	[NT]	[NT]	LCS-1	102%
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	LCS-1	102%
Tin	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	105%
Vanadium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	106%

NATA
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QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	9180-1	31/08/2016
Date analysed	-	[NT]	[NT]	9180-1	31/08/2016
Arsenic	mg/kg	[NT]	[NT]	9180-1	99%
Silver	mg/kg	[NT]	[NT]	9180-1	100%
Beryllium	mg/kg	[NT]	[NT]	9180-1	104%
Boron	mg/kg	[NT]	[NT]	9180-1	114%
Cadmium	mg/kg	[NT]	[NT]	9180-1	91%
Chromium	mg/kg	[NT]	[NT]	9180-1	103%
Cobalt	mg/kg	[NT]	[NT]	9180-1	89%
Copper	mg/kg	[NT]	[NT]	9180-1	72%
Mercury	mg/kg	[NT]	[NT]	9180-1	#
Manganese	mg/kg	[NT]	[NT]	9180-1	110%
Molybdenum	mg/kg	[NT]	[NT]	9180-1	86%
Nickel	mg/kg	[NT]	[NT]	9180-1	94%
Lead	mg/kg	[NT]	[NT]	9180-1	#
Antimony	mg/kg	[NT]	[NT]	9180-1	##
Selenium	mg/kg	[NT]	[NT]	9180-1	94%
Tin	mg/kg	[NT]	[NT]	9180-1	93%
Vanadium	mg/kg	[NT]	[NT]	9180-1	103%
Zinc	mg/kg	[NT]	[NT]	9180-1	#

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Report Comments:

METALS - # Percent recovery is not possible to report due to the high concentration of Lead, Mercury & Zinc in the sample. However an acceptable recovery was obtained for the LCS.

Percent recovery not available due to matrix interference, however an acceptable recovery was achieved for the LCS.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab — [illegible]

☐ Eurofins | mgt Brisbane Lab — [illegible]

☐ Eurofins | mgt Melbourne Lab — [illegible]

Company	Mott MacDonald	Purchase Order	
Address	LM 22 King William St Adelaide, 5000	Eurofins | mgt Quote №	
Contact Name	Rebecca Lucock	Project Manager	Rebecca Lucock
Contact Phone №	(08) 7325 7358	Project №	371768
Special Direction	cc: ashley.moore@mottmac.com	Project Name	Kent Town
Relinquished by (Signature)	Bridy Baney	Electronic Results Format	
(Time / Date)	4pm 26/8/16	Email for Results	rebecca.lucock@mottmac.com
		Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std) ☐ Other ( )

Analysis (Please tick which analysis are required, please type in "Other" if needed)

№	Client Sample ID	Date	Matrix	OCP	VOC	TPH(C6-C9)	Short VIC Ext Screen	Containers	Method of Shipment
1	QC08_26/8/16	26/8/16	SOIL						☐ Courier (#) ☐ Hand Delivered ☐ Postal
2	SB07/4_3.0-3.1								Sample Comments / DG Hazard Warning
3	SB07/5_5.0-5.1								
4	SB07/6_6.9-7.0								
5	SB12/1_0.09-0.2								
6	SB12/2_0.45_0.55								
7	SB12/3_1.1-1.2								
8	SB13/1_0.09-0.2								
9	SB13/2_0.25-0.35								
10	SB13/3_0.4-0.5								
11	SB13/4_1.0-1.1								
12	SB14/1_0.12-0.22								

ENVIROLAB GROUP

Envirolab Services
12 Ashley Street
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 91805

Date Received: 26/8/16

Time Received: 12:15

Received by:

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

2.8°

Laboratory Use Only											
	Received By	Pasquinal	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №	

QS3009_7.4 Modified by S Keyes Approved by T Lakeland Approved on 17 August 2015

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request

Q COC → Envirolab please

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab ☐ Eurofins | mgt Brisbane Lab ☐ Eurofins | mgt Melbourne Lab

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768
Contact Name	Rebecca Lucock				
Contact Phone №	(08) 7325 7358				
Special Direction	cc: ashley.maude@mottmac.com				
Relinquished by (Signature)	Brady Barney				
(Time / Date)	4 pm 26/8/16				

Project Name	Kent Town
Electronic Results Format	
Email for Results	rebecca.lucock@mottmac.com
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )

Analytes (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	COC	HM (16)	R6 Vic EPA - short suite	BTEX	Cr6	TRH	Asbestos (ID in soil)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	SB14/2_0.3-0.4	26/8/16	Soil							/							1	
2	SB14/3_0.6-0.7																1	
3	SB14/4_1.2-1.3																1	
4	SB15/1_0.0-0.1																1	
5	SB15/2_0.1-0.3																1	
6	SB15/3_0.3-0.4					/											1	
7	SB15/4_0.85-0.95																1	
8	SB15/5_1.5-1.6	↓	↓														1	
9	RIN01_25/8/16	25/8/16	Water		/								1		2	1		
10	RIN02_26/8/16	26/8/16	↓		/								1		2	1		
11	Trip01_25/8/16	25/8/16	↓				/								1			
12																		

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Laboratory Use Only									
Received By	Pat Kinnaird	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	26/8/16	Time	3.45pm	Signature		Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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Certificate of Analysis

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **- Rebecca Lucock**

Report **513565-W**
Project name KENT TOWN
Project ID 371768
Received Date Aug 29, 2016

Client Sample ID			**RIN01_25/8/16**	**RIN02_26/8/16**	**TRIP01_25/8/16**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M16-Au26950**	**M16-Au26951**	**M16-Au26952**
Date Sampled			**Aug 25, 2016**	**Aug 26, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit			
BTEX					
Benzene	0.001	mg/L	-	-	< 0.001
Toluene	0.001	mg/L	-	-	< 0.001
Ethylbenzene	0.001	mg/L	-	-	< 0.001
m&p-Xylenes	0.002	mg/L	-	-	< 0.002
o-Xylene	0.001	mg/L	-	-	< 0.001
Xylenes - Total	0.003	mg/L	-	-	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	-	53
Heavy Metals					
Antimony	0.005	mg/L	< 0.005	< 0.005	-
Arsenic	0.001	mg/L	< 0.001	< 0.001	-
Beryllium	0.001	mg/L	< 0.001	< 0.001	-
Boron	0.05	mg/L	< 0.05	< 0.05	-
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	-
Chromium	0.001	mg/L	< 0.001	< 0.001	-
Cobalt	0.001	mg/L	< 0.001	< 0.001	-
Copper	0.001	mg/L	< 0.001	< 0.001	-
Lead	0.001	mg/L	< 0.001	< 0.001	-
Manganese	0.005	mg/L	< 0.005	< 0.005	-
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	-
Molybdenum	0.005	mg/L	< 0.005	< 0.005	-
Nickel	0.001	mg/L	< 0.001	< 0.001	-
Selenium	0.001	mg/L	< 0.001	< 0.001	-
Silver	0.005	mg/L	< 0.005	< 0.005	-
Tin	0.005	mg/L	< 0.005	< 0.005	-
Vanadium	0.005	mg/L	< 0.005	< 0.005	-
Zinc	0.005	mg/L	< 0.005	< 0.005	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Aug 31, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M18	Melbourne	Aug 30, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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NATA # 1261 Site # 20794

Company Name: Mott MacDonald
Address: Mezzanine Level, 22 King William St
Adelaide
SA 5000

Project Name: KENT TOWN
Project ID: 371768

Order No.:
Report #: 513565
Phone: 08 7325 7325
Fax:

Received: Aug 29, 2016 4:27 PM
Due: Sep 5, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	BTEX	Metals M18	Volatile Organics	Moisture Set	Vic EPA Short Screen	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	SB01/2_0.6-0.7	Aug 25, 2016		Soil	M16-Au26933						X		X		
2	SB02/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26934	X									
3	SB03/2_0.4-0.5	Aug 25, 2016		Soil	M16-Au26935			X					X		
4	SB04/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26936								X	X	
5	SB05/5_2.9-3.0	Aug 25, 2016		Soil	M16-Au26937								X		X
6	SB06/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26938								X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
7	SB04/6_5.9-6.0	Aug 25, 2016		Soil	M16-Au26939							X	X		
8	SB08/2_1.0-1.1	Aug 25, 2016		Soil	M16-Au26940						X		X		
9	SB10/1_0.1-0.2	Aug 25, 2016		Soil	M16-Au26941				X				X		
10	SB11/1_0.09-0.2	Aug 25, 2016		Soil	M16-Au26942				X				X		
11	QC04_25/8/16	Aug 25, 2016		Soil	M16-Au26943						X		X		
12	SB07/5_5.0-5.1	Aug 26, 2016		Soil	M16-Au26944							X	X		
13	SB12/1_0.09-0.2	Aug 26, 2016		Soil	M16-Au26945				X				X		
14	SB13/2_0.25-	Aug 26, 2016		Soil	M16-Au26946								X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.35														
15	SB14/1_0.12-0.22	Aug 26, 2016		Soil	M16-Au26947				X				X		
16	SB14/2_0.3-0.4	Aug 26, 2016		Soil	M16-Au26948	X									
17	SB15/3_0.3-0.4	Aug 26, 2016		Soil	M16-Au26949								X	X	
18	RIN01_25/8/16	Aug 25, 2016		Water	M16-Au26950						X				
19	RIN02_26/8/16	Aug 26, 2016		Water	M16-Au26951						X				
20	TRIP01_25/8/16	Aug 25, 2016		Water	M16-Au26952					X					
21	SB01/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26953		X								
22	SB01/3_1.0-	Aug 25, 2016		Soil	M16-Au26954		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	1.1														
23	SB01/4_1.9-2.0	Aug 25, 2016		Soil	M16-Au26955		X								
24	SB02/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26956		X								
25	SB02/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26957		X								
26	SB02/4_1.7-1.8	Aug 25, 2016		Soil	M16-Au26958		X								
27	SB03/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26959		X								
28	SB03/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26960		X								
29	SB04/1_0.05-	Aug 25, 2016		Soil	M16-Au26961		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.2														
30	SB04/3_1.1-1.2	Aug 25, 2016		Soil	M16-Au26962		X								
31	SB05/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26963		X								
32	SB05/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26964		X								
33	SB05/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26965		X								
34	SB05/4_2.0-2.1	Aug 25, 2016		Soil	M16-Au26966		X								
35	SB06/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26967		X								
36	SB06/3_0.9-	Aug 25, 2016		Soil	M16-Au26968		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	1.0														
37	SB06/4_1.4-1.5	Aug 25, 2016		Soil	M16-Au26969		X								
38	SB07/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26970		X								
39	SB07/2_0.4-0.5	Aug 25, 2016		Soil	M16-Au26971		X								
40	SB07/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26972		X								
41	SB04/4_4.3-4.4	Aug 25, 2016		Soil	M16-Au26973		X								
42	SB04/5_4.5-4.6	Aug 25, 2016		Soil	M16-Au26974		X								
43	SB08/1_0.2-	Aug 25, 2016		Soil	M16-Au26975		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.3														
44	SB08/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26976		X								
45	SB09/1_0.2-0.3	Aug 25, 2016		Soil	M16-Au26977		X								
46	SB09/2_0.9-1.0	Aug 25, 2016		Soil	M16-Au26978		X								
47	SB09/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26979		X								
48	SB10/2_1.1-1.2	Aug 25, 2016		Soil	M16-Au26980		X								
49	SB10/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26981		X								
50	SB11/2_0.8-	Aug 25, 2016		Soil	M16-Au26982		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.9														
51	SB11/3_1.7-1.8	Aug 25, 2016		Soil	M16-Au26983		X								
52	QC01_25/8/16	Aug 25, 2016		Soil	M16-Au26984		X								
53	QC02_25/8/16	Aug 25, 2016		Soil	M16-Au26985		X								
54	QC03_25/8/16	Aug 25, 2016		Soil	M16-Au26986		X								
55	QC05_25/8/16	Aug 25, 2016		Soil	M16-Au26987		X								
56	QC06_25/8/16	Aug 25, 2016		Soil	M16-Au26988		X								
57	QC07_25/8/16	Aug 26, 2016		Soil	M16-Au26989		X								
58	SB07/4_3.0-3.1	Aug 26, 2016		Soil	M16-Au26990		X								
59	SB07/6_6.9-7.0	Aug 26, 2016		Soil	M16-Au26991		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
60	SB12/2_0.45-0.55	Aug 26, 2016		Soil	M16-Au26992		X								
61	SB12/3_1.1-1.2	Aug 26, 2016		Soil	M16-Au26993		X								
62	SB13/1_0.09-0.2	Aug 26, 2016		Soil	M16-Au26994		X								
63	SB13/3_0.4-0.5	Aug 26, 2016		Soil	M16-Au26995		X								
64	SB13/4_1.0-1.1	Aug 26, 2016		Soil	M16-Au26996		X								
65	SB14/3_0.6-0.7	Aug 26, 2016		Soil	M16-Au26997		X								
66	SB14/4_1.2-1.3	Aug 26, 2016		Soil	M16-Au26998		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
67	SB15/1_0.0-0.1	Aug 26, 2016		Soil	M16-Au26999		X								
68	SB15/2_0.1-0.3	Aug 26, 2016		Soil	M16-Au27000		X								
69	SB15/4_0.85-0.95	Aug 26, 2016		Soil	M16-Au27001		X								
70	SB15/5_1.5-1.6	Aug 26, 2016		Soil	M16-Au27002		X								
Test Counts						2	50	1	4	1	5	2	15	4	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Heavy Metals							
Antimony	mg/L	< 0.005			0.005	Pass	
Arsenic	mg/L	< 0.001			0.001	Pass	
Beryllium	mg/L	< 0.001			0.001	Pass	
Boron	mg/L	< 0.05			0.05	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Cobalt	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Molybdenum	mg/L	< 0.005			0.005	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Selenium	mg/L	< 0.001			0.001	Pass	
Silver	mg/L	< 0.005			0.005	Pass	
Tin	mg/L	< 0.005			0.005	Pass	
Vanadium	mg/L	< 0.005			0.005	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	89			70-130	Pass	
Toluene	%	72			70-130	Pass	
Ethylbenzene	%	72			70-130	Pass	
m&p-Xylenes	%	82			70-130	Pass	
Xylenes - Total	%	82			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	93			80-120	Pass	
Arsenic	%	97			80-120	Pass	
Beryllium	%	93			80-120	Pass	
Cadmium	%	98			80-120	Pass	
Chromium	%	94			80-120	Pass	
Cobalt	%	96			80-120	Pass	
Copper	%	96			80-120	Pass	
Lead	%	99			80-120	Pass	
Manganese	%	96			80-120	Pass	
Mercury	%	95			75-125	Pass	
Molybdenum	%	97			80-120	Pass	
Nickel	%	95			80-120	Pass	
Selenium	%	97			80-120	Pass	
Silver	%	84			80-120	Pass	
Tin	%	97			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Vanadium			%	99			80-120	Pass	
Zinc			%	98			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	M16-Au26294	NCP	%	91			70-130	Pass	
Arsenic	M16-Au26294	NCP	%	95			75-125	Pass	
Beryllium	M16-Au26294	NCP	%	89			75-125	Pass	
Cadmium	M16-Au26294	NCP	%	94			75-125	Pass	
Chromium	M16-Au26294	NCP	%	88			75-125	Pass	
Cobalt	M16-Au26294	NCP	%	91			75-125	Pass	
Copper	M16-Au26294	NCP	%	91			75-125	Pass	
Lead	M16-Au26294	NCP	%	91			75-125	Pass	
Manganese	M16-Au26294	NCP	%	90			75-125	Pass	
Molybdenum	M16-Au26294	NCP	%	94			75-125	Pass	
Nickel	M16-Au26294	NCP	%	93			75-125	Pass	
Selenium	M16-Au26294	NCP	%	93			75-125	Pass	
Silver	M16-Au26294	NCP	%	91			75-125	Pass	
Tin	M16-Au26294	NCP	%	91			75-125	Pass	
Vanadium	M16-Au26294	NCP	%	93			75-125	Pass	
Zinc	M16-Au26294	NCP	%	92			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	M16-Au26294	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Arsenic	M16-Au26294	NCP	mg/L	0.001	0.001	6.0	30%	Pass	
Beryllium	M16-Au26294	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Boron	M16-Se00198	NCP	mg/L	0.70	0.77	10	30%	Pass	
Cadmium	M16-Au26294	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M16-Au26294	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt	M16-Au26294	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M16-Au26294	NCP	mg/L	0.001	0.002	19	30%	Pass	
Lead	M16-Au26294	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese	M16-Au26294	NCP	mg/L	0.013	0.013	3.0	30%	Pass	
Mercury	M16-Au23349	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Molybdenum	M16-Au26294	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel	M16-Au26294	NCP	mg/L	0.002	0.002	3.0	30%	Pass	
Selenium	M16-Au26294	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Silver	M16-Au26294	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Tin	M16-Au26294	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Vanadium	M16-Au26294	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc	M16-Au26294	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)



Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **- Rebecca Lucock**

Report **513565-S**
Project name KENT TOWN
Project ID 371768
Received Date Aug 29, 2016

Client Sample ID			**SB01/2_0.6-0.7**	**SB03/2_0.4-0.5**	**SB04/2_0.3-0.4**	**SB05/5_2.9-3.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26933**	**M16-Au26935**	**M16-Au26936**	**M16-Au26937**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	-	< 50	< 50
TRH C29-C36	50	mg/kg	-	-	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	-	-	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	89	-
Volatile Organics						
1.2.4-Trichlorobenzene	0.2	mg/kg	-	-	-	< 0.2
Hexachlorobutadiene	0.2	mg/kg	-	-	-	< 0.2
1.1-Dichloroethane	0.05	mg/kg	-	-	-	< 0.05
1.1-Dichloroethene	0.05	mg/kg	-	-	-	< 0.05
1.1.1-Trichloroethane	0.05	mg/kg	-	-	-	< 0.05
1.1.1.2-Tetrachloroethane	0.05	mg/kg	-	-	-	< 0.05
1.1.2-Trichloroethane	0.05	mg/kg	-	-	-	< 0.05
1.1.2.2-Tetrachloroethane	0.05	mg/kg	-	-	-	< 0.05
1.2-Dibromoethane	0.05	mg/kg	-	-	-	< 0.05
1.2-Dichlorobenzene	0.05	mg/kg	-	-	-	< 0.05
1.2-Dichloroethane	0.05	mg/kg	-	-	-	< 0.05
1.2-Dichloropropane	0.05	mg/kg	-	-	-	< 0.05
1.2.3-Trichloropropane	0.05	mg/kg	-	-	-	< 0.05
1.2.4-Trimethylbenzene	0.05	mg/kg	-	-	-	< 0.05
1.3-Dichlorobenzene	0.05	mg/kg	-	-	-	< 0.05
1.3-Dichloropropane	0.05	mg/kg	-	-	-	< 0.05
1.3.5-Trimethylbenzene	0.05	mg/kg	-	-	-	< 0.05
1.4-Dichlorobenzene	0.05	mg/kg	-	-	-	< 0.05
2-Butanone (MEK)	0.05	mg/kg	-	-	-	< 0.05
2-Propanone (Acetone)	0.05	mg/kg	-	-	-	< 0.05
4-Chlorotoluene	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID			SB01/2_0.6-0.7	SB03/2_0.4-0.5	SB04/2_0.3-0.4	SB05/5_2.9-3.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26933**	**M16-Au26935**	**M16-Au26936**	**M16-Au26937**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit				
Volatile Organics						
4-Methyl-2-pentanone (MIBK)	0.05	mg/kg	-	-	-	< 0.05
Allyl chloride	0.05	mg/kg	-	-	-	< 0.05
Benzene	0.1	mg/kg	-	-	-	< 0.1
Bromobenzene	0.05	mg/kg	-	-	-	< 0.05
Bromochloromethane	0.05	mg/kg	-	-	-	< 0.05
Bromodichloromethane	0.05	mg/kg	-	-	-	< 0.05
Bromoform	0.05	mg/kg	-	-	-	< 0.05
Bromomethane	0.05	mg/kg	-	-	-	< 0.05
Carbon disulfide	0.05	mg/kg	-	-	-	< 0.05
Carbon Tetrachloride	0.05	mg/kg	-	-	-	< 0.05
Chlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Chloroethane	0.05	mg/kg	-	-	-	< 0.05
Chloroform	0.05	mg/kg	-	-	-	< 0.05
Chloromethane	0.05	mg/kg	-	-	-	< 0.05
cis-1.2-Dichloroethene	0.05	mg/kg	-	-	-	< 0.05
cis-1.3-Dichloropropene	0.05	mg/kg	-	-	-	< 0.05
Dibromochloromethane	0.05	mg/kg	-	-	-	< 0.05
Dibromomethane	0.05	mg/kg	-	-	-	< 0.05
Dichlorodifluoromethane	0.05	mg/kg	-	-	-	< 0.05
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
Iodomethane	0.05	mg/kg	-	-	-	< 0.05
Isopropyl benzene (Cumene)	0.05	mg/kg	-	-	-	< 0.05
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
Methylene Chloride	0.05	mg/kg	-	-	-	< 0.05
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Styrene	0.05	mg/kg	-	-	-	< 0.05
Tetrachloroethene	0.05	mg/kg	-	-	-	< 0.05
Toluene	0.1	mg/kg	-	-	-	< 0.1
trans-1.2-Dichloroethene	0.05	mg/kg	-	-	-	< 0.05
trans-1.3-Dichloropropene	0.05	mg/kg	-	-	-	< 0.05
Trichloroethene	0.05	mg/kg	-	-	-	< 0.05
Trichlorofluoromethane	0.05	mg/kg	-	-	-	< 0.05
Vinyl chloride	0.05	mg/kg	-	-	-	< 0.05
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
Fluorobenzene (surr.)	1	%	-	-	-	78
4-Bromofluorobenzene (surr.)	1	%	-	-	-	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	< 50
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5

Client Sample ID			SB01/2_0.6-0.7	SB03/2_0.4-0.5	SB04/2_0.3-0.4	SB05/5_2.9-3.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26933**	**M16-Au26935**	**M16-Au26936**	**M16-Au26937**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	104	97	94
p-Terphenyl-d14 (surr.)	1	%	-	109	109	87
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Toxaphene	1	mg/kg	-	-	< 1	< 1
Dibutylchlorendate (surr.)	1	%	-	-	134	95
Tetrachloro-m-xylene (surr.)	1	%	-	-	90	86
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	-	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	134	95
Tetrachloro-m-xylene (surr.)	1	%	-	-	90	86

Client Sample ID			SB01/2_0.6-0.7	SB03/2_0.4-0.5	SB04/2_0.3-0.4	SB05/5_2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Au26933	M16-Au26935	M16-Au26936	M16-Au26937
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4.5-Trichlorophenol	1.0	mg/kg	-	-	< 1	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	-	-	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chloro-3-methylphenol	1.0	mg/kg	-	-	< 1	< 1
Pentachlorophenol	1.0	mg/kg	-	-	< 1	< 1
Tetrachlorophenols - Total	1.0	mg/kg	-	-	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	-	< 5	< 5
Dinoseb	20	mg/kg	-	-	< 20	< 20
Phenol	0.5	mg/kg	-	-	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	< 20
Phenol-d6 (surr.)	1	%	-	-	104	105
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	< 100	< 100
TRH >C34-C40	100	mg/kg	-	-	< 100	< 100
Chromium (hexavalent)	1	mg/kg	-	-	-	< 1
Cyanide (total)	5	mg/kg	-	-	< 5	< 5
Fluoride	100	mg/kg	-	-	< 100	< 100
pH (1:5 Aqueous extract)	0.1	pH Units	-	-	-	8.9
% Moisture	1	%	12	18	11	8.7
Heavy Metals						
Antimony	10	mg/kg	< 10	-	-	-
Arsenic	2	mg/kg	< 2	-	< 2	3.9
Beryllium	2	mg/kg	< 2	-	-	-
Boron	10	mg/kg	< 10	-	-	-
Cadmium	0.4	mg/kg	15	-	< 0.4	0.5
Chromium	5	mg/kg	20	-	20	19
Cobalt	5	mg/kg	8.0	-	-	-
Copper	5	mg/kg	60	-	15	6.7
Lead	5	mg/kg	2000	-	51	9.0
Manganese	5	mg/kg	390	-	-	-
Mercury	0.1	mg/kg	0.9	-	0.1	< 0.1
Molybdenum	5	mg/kg	< 5	-	< 5	< 5
Nickel	5	mg/kg	10	-	9.6	9.0
Selenium	2	mg/kg	< 2	-	< 2	< 2
Silver	0.2	mg/kg	0.4	-	< 0.2	< 0.2
Tin	10	mg/kg	280	-	16	< 10

Client Sample ID			SB01/2_0.6-0.7	SB03/2_0.4-0.5	SB04/2_0.3-0.4	SB05/5_2.9-3.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26933**	**M16-Au26935**	**M16-Au26936**	**M16-Au26937**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Vanadium	10	mg/kg	20	-	-	-
Zinc	5	mg/kg	17000	-	76	24

Client Sample ID			SB06/2_0.3-0.4	SB04/6_5.9-6.0	SB08/2_1.0-1.1	SB10/1_0.1-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26938**	**M16-Au26939**	**M16-Au26940**	**M16-Au26941**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	< 20	-	-	-
TRH C15-C28	50	mg/kg	< 50	-	-	-
TRH C29-C36	50	mg/kg	< 50	-	-	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
4-Bromofluorobenzene (surr.)	1	%	77	-	-	-
Volatile Organics						
1.1-Dichloroethane	0.05	mg/kg	-	< 0.05	-	-
1.1-Dichloroethene	0.05	mg/kg	-	< 0.05	-	-
1.1.1-Trichloroethane	0.05	mg/kg	-	< 0.05	-	-
1.1.1.2-Tetrachloroethane	0.05	mg/kg	-	< 0.05	-	-
1.1.2-Trichloroethane	0.05	mg/kg	-	< 0.05	-	-
1.1.2.2-Tetrachloroethane	0.05	mg/kg	-	< 0.05	-	-
1.2-Dibromoethane	0.05	mg/kg	-	< 0.05	-	-
1.2-Dichlorobenzene	0.05	mg/kg	-	< 0.05	-	-
1.2-Dichloroethane	0.05	mg/kg	-	< 0.05	-	-
1.2-Dichloropropane	0.05	mg/kg	-	< 0.05	-	-
1.2.3-Trichloropropane	0.05	mg/kg	-	< 0.05	-	-
1.2.4-Trimethylbenzene	0.05	mg/kg	-	< 0.05	-	-
1.3-Dichlorobenzene	0.05	mg/kg	-	< 0.05	-	-
1.3-Dichloropropane	0.05	mg/kg	-	< 0.05	-	-
1.3.5-Trimethylbenzene	0.05	mg/kg	-	< 0.05	-	-
1.4-Dichlorobenzene	0.05	mg/kg	-	< 0.05	-	-
2-Butanone (MEK)	0.05	mg/kg	-	< 0.05	-	-
2-Propanone (Acetone)	0.05	mg/kg	-	< 0.05	-	-
4-Chlorotoluene	0.05	mg/kg	-	< 0.05	-	-
4-Methyl-2-pentanone (MIBK)	0.05	mg/kg	-	< 0.05	-	-
Allyl chloride	0.05	mg/kg	-	< 0.05	-	-
Benzene	0.1	mg/kg	-	< 0.1	-	-
Bromobenzene	0.05	mg/kg	-	< 0.05	-	-
Bromochloromethane	0.05	mg/kg	-	< 0.05	-	-
Bromodichloromethane	0.05	mg/kg	-	< 0.05	-	-

Client Sample ID			SB06/2_0.3-0.4	SB04/6_5.9-6.0	SB08/2_1.0-1.1	SB10/1_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Au26938	M16-Au26939	M16-Au26940	M16-Au26941
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit				
Volatile Organics						
Bromoform	0.05	mg/kg	-	< 0.05	-	-
Bromomethane	0.05	mg/kg	-	< 0.05	-	-
Carbon disulfide	0.05	mg/kg	-	< 0.05	-	-
Carbon Tetrachloride	0.05	mg/kg	-	< 0.05	-	-
Chlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Chloroethane	0.05	mg/kg	-	< 0.05	-	-
Chloroform	0.05	mg/kg	-	< 0.05	-	-
Chloromethane	0.05	mg/kg	-	< 0.05	-	-
cis-1.2-Dichloroethene	0.05	mg/kg	-	< 0.05	-	-
cis-1.3-Dichloropropene	0.05	mg/kg	-	< 0.05	-	-
Dibromochloromethane	0.05	mg/kg	-	< 0.05	-	-
Dibromomethane	0.05	mg/kg	-	< 0.05	-	-
Dichlorodifluoromethane	0.05	mg/kg	-	< 0.05	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
Iodomethane	0.05	mg/kg	-	< 0.05	-	-
Isopropyl benzene (Cumene)	0.05	mg/kg	-	< 0.05	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
Methylene Chloride	0.05	mg/kg	-	< 0.05	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Styrene	0.05	mg/kg	-	< 0.05	-	-
Tetrachloroethene	0.05	mg/kg	-	< 0.05	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
trans-1.2-Dichloroethene	0.05	mg/kg	-	< 0.05	-	-
trans-1.3-Dichloropropene	0.05	mg/kg	-	< 0.05	-	-
Trichloroethene	0.05	mg/kg	-	< 0.05	-	-
Trichlorofluoromethane	0.05	mg/kg	-	< 0.05	-	-
Vinyl chloride	0.05	mg/kg	-	< 0.05	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
Fluorobenzene (surr.)	1	%	-	85	-	-
4-Bromofluorobenzene (surr.)	1	%	-	79	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	SB06/2_0.3-0.4 Soil M16-Au26938 Aug 25, 2016	SB04/6_5.9-6.0 Soil M16-Au26939 Aug 25, 2016	SB08/2_1.0-1.1 Soil M16-Au26940 Aug 25, 2016	SB10/1_0.1-0.2 Soil M16-Au26941 Aug 25, 2016
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	94	-	-	-
p-Terphenyl-d14 (surr.)	1	%	100	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	1	mg/kg	< 1	-	-	< 1
Dibutylchlorendate (surr.)	1	%	96	-	-	132
Tetrachloro-m-xylene (surr.)	1	%	90	-	-	90
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	96	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	90	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1.0	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	-	-	-

Client Sample ID			SB06/2_0.3-0.4	SB04/6_5.9-6.0	SB08/2_1.0-1.1	SB10/1_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Au26938	M16-Au26939	M16-Au26940	M16-Au26941
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	-	-	-
Pentachlorophenol	1.0	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	1.0	mg/kg	< 1	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1.0	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	106	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
Cyanide (total)	5	mg/kg	< 5	-	-	-
Fluoride	100	mg/kg	< 100	-	-	-
% Moisture	1	%	18	16	9.4	14
Heavy Metals						
Antimony	10	mg/kg	-	-	< 10	-
Arsenic	2	mg/kg	< 2	-	< 2	-
Beryllium	2	mg/kg	-	-	< 2	-
Boron	10	mg/kg	-	-	< 10	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	40	-	25	-
Cobalt	5	mg/kg	-	-	11	-
Copper	5	mg/kg	24	-	13	-
Lead	5	mg/kg	15	-	9.7	-
Manganese	5	mg/kg	-	-	300	-
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	-
Molybdenum	5	mg/kg	< 5	-	< 5	-
Nickel	5	mg/kg	23	-	12	-
Selenium	2	mg/kg	< 2	-	< 2	-
Silver	0.2	mg/kg	< 0.2	-	< 0.2	-
Tin	10	mg/kg	< 10	-	< 10	-
Vanadium	10	mg/kg	-	-	34	-
Zinc	5	mg/kg	54	-	20	-

Client Sample ID			SB11/1_0.09-0.2	QC04_25/8/16	SB07/5_5.0-5.1	SB12/1_0.09-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Au26942	M16-Au26943	M16-Au26944	M16-Au26945
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 26, 2016	Aug 26, 2016
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.05	mg/kg	-	-	< 0.05	-
1.1-Dichloroethene	0.05	mg/kg	-	-	< 0.05	-
1.1.1-Trichloroethane	0.05	mg/kg	-	-	< 0.05	-
1.1.1.2-Tetrachloroethane	0.05	mg/kg	-	-	< 0.05	-
1.1.2-Trichloroethane	0.05	mg/kg	-	-	< 0.05	-
1.1.2.2-Tetrachloroethane	0.05	mg/kg	-	-	< 0.05	-
1.2-Dibromoethane	0.05	mg/kg	-	-	< 0.05	-
1.2-Dichlorobenzene	0.05	mg/kg	-	-	< 0.05	-
1.2-Dichloroethane	0.05	mg/kg	-	-	< 0.05	-
1.2-Dichloropropane	0.05	mg/kg	-	-	< 0.05	-
1.2.3-Trichloropropane	0.05	mg/kg	-	-	< 0.05	-
1.2.4-Trimethylbenzene	0.05	mg/kg	-	-	< 0.05	-
1.3-Dichlorobenzene	0.05	mg/kg	-	-	< 0.05	-
1.3-Dichloropropane	0.05	mg/kg	-	-	< 0.05	-
1.3.5-Trimethylbenzene	0.05	mg/kg	-	-	< 0.05	-
1.4-Dichlorobenzene	0.05	mg/kg	-	-	< 0.05	-
2-Butanone (MEK)	0.05	mg/kg	-	-	< 0.05	-
2-Propanone (Acetone)	0.05	mg/kg	-	-	< 0.05	-
4-Chlorotoluene	0.05	mg/kg	-	-	< 0.05	-
4-Methyl-2-pentanone (MIBK)	0.05	mg/kg	-	-	< 0.05	-
Allyl chloride	0.05	mg/kg	-	-	< 0.05	-
Benzene	0.1	mg/kg	-	-	< 0.1	-
Bromobenzene	0.05	mg/kg	-	-	< 0.05	-
Bromochloromethane	0.05	mg/kg	-	-	< 0.05	-
Bromodichloromethane	0.05	mg/kg	-	-	< 0.05	-
Bromoform	0.05	mg/kg	-	-	< 0.05	-
Bromomethane	0.05	mg/kg	-	-	< 0.05	-
Carbon disulfide	0.05	mg/kg	-	-	< 0.05	-
Carbon Tetrachloride	0.05	mg/kg	-	-	< 0.05	-
Chlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Chloroethane	0.05	mg/kg	-	-	< 0.05	-
Chloroform	0.05	mg/kg	-	-	< 0.05	-
Chloromethane	0.05	mg/kg	-	-	< 0.05	-
cis-1.2-Dichloroethene	0.05	mg/kg	-	-	< 0.05	-
cis-1.3-Dichloropropene	0.05	mg/kg	-	-	< 0.05	-
Dibromochloromethane	0.05	mg/kg	-	-	< 0.05	-
Dibromomethane	0.05	mg/kg	-	-	< 0.05	-
Dichlorodifluoromethane	0.05	mg/kg	-	-	< 0.05	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
Iodomethane	0.05	mg/kg	-	-	< 0.05	-
Isopropyl benzene (Cumene)	0.05	mg/kg	-	-	< 0.05	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
Methylene Chloride	0.05	mg/kg	-	-	< 0.05	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Styrene	0.05	mg/kg	-	-	< 0.05	-
Tetrachloroethene	0.05	mg/kg	-	-	< 0.05	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
trans-1.2-Dichloroethene	0.05	mg/kg	-	-	< 0.05	-
trans-1.3-Dichloropropene	0.05	mg/kg	-	-	< 0.05	-

Client Sample ID			SB11/1_0.09-0.2	QC04_25/8/16	SB07/5_5.0-5.1	SB12/1_0.09-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26942**	**M16-Au26943**	**M16-Au26944**	**M16-Au26945**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 26, 2016**	**Aug 26, 2016**
Test/Reference	LOR	Unit				
Volatile Organics						
Trichloroethene	0.05	mg/kg	-	-	< 0.05	-
Trichlorofluoromethane	0.05	mg/kg	-	-	< 0.05	-
Vinyl chloride	0.05	mg/kg	-	-	< 0.05	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
Fluorobenzene (surr.)	1	%	-	-	85	-
4-Bromofluorobenzene (surr.)	1	%	-	-	82	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	0.07	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	0.20	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	0.11	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	1	mg/kg	< 1	-	-	< 1
Dibutylchlorendate (surr.)	1	%	104	-	-	93
Tetrachloro-m-xylene (surr.)	1	%	74	-	-	81
% Moisture	1	%	8.0	19	12	6.8
Heavy Metals						
Antimony	10	mg/kg	-	< 10	-	-
Arsenic	2	mg/kg	-	< 2	-	-
Beryllium	2	mg/kg	-	< 2	-	-
Boron	10	mg/kg	-	< 10	-	-
Cadmium	0.4	mg/kg	-	< 0.4	-	-
Chromium	5	mg/kg	-	35	-	-
Cobalt	5	mg/kg	-	9.6	-	-
Copper	5	mg/kg	-	19	-	-
Lead	5	mg/kg	-	12	-	-
Manganese	5	mg/kg	-	220	-	-
Mercury	0.1	mg/kg	-	< 0.1	-	-
Molybdenum	5	mg/kg	-	< 5	-	-
Nickel	5	mg/kg	-	21	-	-
Selenium	2	mg/kg	-	< 2	-	-
Silver	0.2	mg/kg	-	< 0.2	-	-
Tin	10	mg/kg	-	< 10	-	-

Client Sample ID			SB11/1_0.09-0.2	QC04_25/8/16	SB07/5_5.0-5.1	SB12/1_0.09-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26942**	**M16-Au26943**	**M16-Au26944**	**M16-Au26945**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 26, 2016**	**Aug 26, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Vanadium	10	mg/kg	-	40	-	-
Zinc	5	mg/kg	-	42	-	-

Client Sample ID			SB13/2_0.25-0.35	SB14/1_0.12-0.22	SB15/3_0.3-0.4
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26946**	**M16-Au26947**	**M16-Au26949**
Date Sampled			**Aug 26, 2016**	**Aug 26, 2016**	**Aug 26, 2016**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20
TRH C15-C28	50	mg/kg	< 50	-	69
TRH C29-C36	50	mg/kg	< 50	-	56
TRH C10-36 (Total)	50	mg/kg	< 50	-	125
BTEX					
Benzene	0.1	mg/kg	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	80	-	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50
TRH C6-C10	20	mg/kg	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	0.6	-	3.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.9	-	3.5
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	3.5
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.5	-	2.0
Benzo(a)pyrene	0.5	mg/kg	0.5	-	2.2
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	1.9
Benzo(g.h.i)perylene	0.5	mg/kg	0.5	-	1.8
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	2.0
Chrysene	0.5	mg/kg	0.6	-	1.9
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	0.5
Fluoranthene	0.5	mg/kg	0.8	-	2.8
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	1.3
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	1.1
Pyrene	0.5	mg/kg	0.8	-	2.7

Client Sample ID			SB13/2_0.25-0.35	SB14/1_0.12-0.22	SB15/3_0.3-0.4
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26946**	**M16-Au26947**	**M16-Au26949**
Date Sampled			**Aug 26, 2016**	**Aug 26, 2016**	**Aug 26, 2016**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Total PAH*	0.5	mg/kg	3.7	-	20.2
2-Fluorobiphenyl (surr.)	1	%	107	-	111
p-Terphenyl-d14 (surr.)	1	%	97	-	99
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	0.15
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	0.19	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	123	105	123
Tetrachloro-m-xylene (surr.)	1	%	89	96	80
Polychlorinated Biphenyls					
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	123	-	123
Tetrachloro-m-xylene (surr.)	1	%	89	-	80
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5
2.4.5-Trichlorophenol	1.0	mg/kg	< 1	-	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	-	< 1
Pentachlorophenol	1.0	mg/kg	< 1	-	< 1
Tetrachlorophenols - Total	1.0	mg/kg	< 1	-	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1

Client Sample ID			SB13/2_0.25-0.35	SB14/1_0.12-0.22	SB15/3_0.3-0.4
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Au26946**	**M16-Au26947**	**M16-Au26949**
Date Sampled			**Aug 26, 2016**	**Aug 26, 2016**	**Aug 26, 2016**
Test/Reference	LOR	Unit			
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	< 5
Dinoseb	20	mg/kg	< 20	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20
Phenol-d6 (surr.)	1	%	107	-	115
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	-	100
TRH >C34-C40	100	mg/kg	< 100	-	< 100
Cyanide (total)	5	mg/kg	< 5	-	< 5
Fluoride	100	mg/kg	< 100	-	< 100
% Moisture	1	%	7.6	7.0	11
Heavy Metals					
Arsenic	2	mg/kg	5.9	-	14
Cadmium	0.4	mg/kg	0.5	-	0.6
Chromium	5	mg/kg	13	-	83
Copper	5	mg/kg	53	-	310
Lead	5	mg/kg	180	-	330
Mercury	0.1	mg/kg	0.4	-	0.5
Molybdenum	5	mg/kg	< 5	-	< 5
Nickel	5	mg/kg	10	-	62
Selenium	2	mg/kg	< 2	-	< 2
Silver	0.2	mg/kg	0.2	-	< 0.2
Tin	10	mg/kg	70	-	75
Zinc	5	mg/kg	520	-	940

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Vic EPA IWRG 621 (Solids)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Aug 31, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Volatile Organics	Melbourne	Aug 31, 2016	7 Day
- Method: USEPA 8260 - MGT 350A Volatile Organics by GCMS			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 31, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Aug 31, 2016	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Aug 31, 2016	14 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Polychlorinated Biphenyls	Melbourne	Aug 31, 2016	28 Days
- Method: USEPA 8082 Polychlorinated Biphenyls			
Phenols (Halogenated)	Melbourne	Aug 31, 2016	14 Day
- Method: USEPA 8270 Phenols			
Phenols (non-Halogenated)	Melbourne	Aug 31, 2016	14 Day
- Method: USEPA 8270 Phenols			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 31, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Chromium (hexavalent)	Melbourne	Aug 31, 2016	28 Day
- Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)			
Cyanide (total)	Melbourne	Aug 31, 2016	14 Day
- Method: LTM-INO-4020 Total Free WAD Cyanide by CFA			
Fluoride	Melbourne	Sep 05, 2016	28 Day
- Method: NEPC 404 (Fusion followed by ISE)			
pH (1:5 Aqueous extract)	Melbourne	Aug 31, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
IWRG 621 Metals : Metals M12	Melbourne	Aug 31, 2016	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
BTEX	Melbourne	Aug 31, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
% Moisture	Melbourne	Aug 30, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			
Metals M18	Melbourne	Aug 31, 2016	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			

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Project Name: KENT TOWN
Project ID: 371768

Order No.:
Report #: 513565
Phone: 08 7325 7325
Fax:

Received: Aug 29, 2016 4:27 PM
Due: Sep 5, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	BTEX	Metals M18	Volatile Organics	Moisture Set	Vic EPA Short Screen	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	SB01/2_0.6-0.7	Aug 25, 2016		Soil	M16-Au26933						X		X		
2	SB02/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26934	X									
3	SB03/2_0.4-0.5	Aug 25, 2016		Soil	M16-Au26935			X					X		
4	SB04/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26936								X	X	
5	SB05/5_2.9-3.0	Aug 25, 2016		Soil	M16-Au26937								X		X
6	SB06/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26938								X	X	

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NATA # 1261 Site # 20794

Company Name: Mott MacDonald
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Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	BTEX	Metals M18	Volatile Organics	Moisture Set	Vic EPA Short Screen	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
7	SB04/6_5.9-6.0	Aug 25, 2016		Soil	M16-Au26939							X	X		
8	SB08/2_1.0-1.1	Aug 25, 2016		Soil	M16-Au26940						X		X		
9	SB10/1_0.1-0.2	Aug 25, 2016		Soil	M16-Au26941				X				X		
10	SB11/1_0.09-0.2	Aug 25, 2016		Soil	M16-Au26942				X				X		
11	QC04_25/8/16	Aug 25, 2016		Soil	M16-Au26943						X		X		
12	SB07/5_5.0-5.1	Aug 26, 2016		Soil	M16-Au26944							X	X		
13	SB12/1_0.09-0.2	Aug 26, 2016		Soil	M16-Au26945				X				X		
14	SB13/2_0.25-	Aug 26, 2016		Soil	M16-Au26946								X	X	

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Phone: 08 7325 7325
Fax:

Received: Aug 29, 2016 4:27 PM
Due: Sep 5, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	BTEX	Metals M18	Volatile Organics	Moisture Set	Vic EPA Short Screen	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.35														
15	SB14/1_0.12-0.22	Aug 26, 2016		Soil	M16-Au26947				X				X		
16	SB14/2_0.3-0.4	Aug 26, 2016		Soil	M16-Au26948	X									
17	SB15/3_0.3-0.4	Aug 26, 2016		Soil	M16-Au26949								X	X	
18	RIN01_25/8/16	Aug 25, 2016		Water	M16-Au26950						X				
19	RIN02_26/8/16	Aug 26, 2016		Water	M16-Au26951						X				
20	TRIP01_25/8/16	Aug 25, 2016		Water	M16-Au26952					X					
21	SB01/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26953		X								
22	SB01/3_1.0-	Aug 25, 2016		Soil	M16-Au26954		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	1.1														
23	SB01/4_1.9-2.0	Aug 25, 2016		Soil	M16-Au26955		X								
24	SB02/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26956		X								
25	SB02/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26957		X								
26	SB02/4_1.7-1.8	Aug 25, 2016		Soil	M16-Au26958		X								
27	SB03/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26959		X								
28	SB03/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26960		X								
29	SB04/1_0.05-	Aug 25, 2016		Soil	M16-Au26961		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.2														
30	SB04/3_1.1-1.2	Aug 25, 2016		Soil	M16-Au26962		X								
31	SB05/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26963		X								
32	SB05/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26964		X								
33	SB05/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26965		X								
34	SB05/4_2.0-2.1	Aug 25, 2016		Soil	M16-Au26966		X								
35	SB06/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26967		X								
36	SB06/3_0.9-	Aug 25, 2016		Soil	M16-Au26968		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	1.0														
37	SB06/4_1.4-1.5	Aug 25, 2016		Soil	M16-Au26969		X								
38	SB07/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26970		X								
39	SB07/2_0.4-0.5	Aug 25, 2016		Soil	M16-Au26971		X								
40	SB07/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26972		X								
41	SB04/4_4.3-4.4	Aug 25, 2016		Soil	M16-Au26973		X								
42	SB04/5_4.5-4.6	Aug 25, 2016		Soil	M16-Au26974		X								
43	SB08/1_0.2-	Aug 25, 2016		Soil	M16-Au26975		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.3														
44	SB08/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26976		X								
45	SB09/1_0.2-0.3	Aug 25, 2016		Soil	M16-Au26977		X								
46	SB09/2_0.9-1.0	Aug 25, 2016		Soil	M16-Au26978		X								
47	SB09/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26979		X								
48	SB10/2_1.1-1.2	Aug 25, 2016		Soil	M16-Au26980		X								
49	SB10/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26981		X								
50	SB11/2_0.8-	Aug 25, 2016		Soil	M16-Au26982		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.9														
51	SB11/3_1.7-1.8	Aug 25, 2016		Soil	M16-Au26983		X								
52	QC01_25/8/16	Aug 25, 2016		Soil	M16-Au26984		X								
53	QC02_25/8/16	Aug 25, 2016		Soil	M16-Au26985		X								
54	QC03_25/8/16	Aug 25, 2016		Soil	M16-Au26986		X								
55	QC05_25/8/16	Aug 25, 2016		Soil	M16-Au26987		X								
56	QC06_25/8/16	Aug 25, 2016		Soil	M16-Au26988		X								
57	QC07_25/8/16	Aug 26, 2016		Soil	M16-Au26989		X								
58	SB07/4_3.0-3.1	Aug 26, 2016		Soil	M16-Au26990		X								
59	SB07/6_6.9-7.0	Aug 26, 2016		Soil	M16-Au26991		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
60	SB12/2_0.45-0.55	Aug 26, 2016		Soil	M16-Au26992		X								
61	SB12/3_1.1-1.2	Aug 26, 2016		Soil	M16-Au26993		X								
62	SB13/1_0.09-0.2	Aug 26, 2016		Soil	M16-Au26994		X								
63	SB13/3_0.4-0.5	Aug 26, 2016		Soil	M16-Au26995		X								
64	SB13/4_1.0-1.1	Aug 26, 2016		Soil	M16-Au26996		X								
65	SB14/3_0.6-0.7	Aug 26, 2016		Soil	M16-Au26997		X								
66	SB14/4_1.2-1.3	Aug 26, 2016		Soil	M16-Au26998		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
67	SB15/1_0.0-0.1	Aug 26, 2016		Soil	M16-Au26999		X								
68	SB15/2_0.1-0.3	Aug 26, 2016		Soil	M16-Au27000		X								
69	SB15/4_0.85-0.95	Aug 26, 2016		Soil	M16-Au27001		X								
70	SB15/5_1.5-1.6	Aug 26, 2016		Soil	M16-Au27002		X								
Test Counts						2	50	1	4	1	5	2	15	4	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.2.4-Trichlorobenzene	mg/kg	< 0.2			0.2	Pass	
Hexachlorobutadiene	mg/kg	< 0.2			0.2	Pass	
1.1-Dichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.05			0.05	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dibromoethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
1.2-Dichloroethane	mg/kg	< 0.05			0.05	Pass	
1.2-Dichloropropane	mg/kg	< 0.05			0.05	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.05			0.05	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.05			0.05	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
1.3-Dichloropropane	mg/kg	< 0.05			0.05	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.05			0.05	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.05			0.05	Pass	
2-Butanone (MEK)	mg/kg	< 0.05			0.05	Pass	
2-Propanone (Acetone)	mg/kg	< 0.05			0.05	Pass	
4-Chlorotoluene	mg/kg	< 0.05			0.05	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.05			0.05	Pass	
Allyl chloride	mg/kg	< 0.05			0.05	Pass	
Bromobenzene	mg/kg	< 0.05			0.05	Pass	
Bromochloromethane	mg/kg	< 0.05			0.05	Pass	
Bromodichloromethane	mg/kg	< 0.05			0.05	Pass	
Bromoform	mg/kg	< 0.05			0.05	Pass	
Bromomethane	mg/kg	< 0.05			0.05	Pass	
Carbon disulfide	mg/kg	< 0.05			0.05	Pass	
Carbon Tetrachloride	mg/kg	< 0.05			0.05	Pass	
Chlorobenzene	mg/kg	< 0.05			0.05	Pass	
Chloroethane	mg/kg	< 0.05			0.05	Pass	
Chloroform	mg/kg	< 0.05			0.05	Pass	
Chloromethane	mg/kg	< 0.05			0.05	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromochloromethane	mg/kg	< 0.05			0.05	Pass	
Dibromomethane	mg/kg	< 0.05			0.05	Pass	
Dichlorodifluoromethane	mg/kg	< 0.05			0.05	Pass	
Iodomethane	mg/kg	< 0.05			0.05	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.05			0.05	Pass	
Methylene Chloride	mg/kg	< 0.05			0.05	Pass	
Styrene	mg/kg	< 0.05			0.05	Pass	
Tetrachloroethene	mg/kg	< 0.05			0.05	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.05			0.05	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.05			0.05	Pass	
Trichloroethene	mg/kg	< 0.05			0.05	Pass	
Trichlorofluoromethane	mg/kg	< 0.05			0.05	Pass	
Vinyl chloride	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1.0	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Cyanide (total)	mg/kg	< 5			5	Pass	
Fluoride	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Antimony	mg/kg	< 10			10	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	mg/kg	< 5			5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Tin	mg/kg	< 10			10	Pass	
Vanadium	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	110			70-130	Pass	
TRH C10-C14	%	89			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	100			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
Xylenes - Total	%	102			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	99			70-130	Pass	
1.1.1-Trichloroethane	%	90			70-130	Pass	
1.2-Dichlorobenzene	%	100			70-130	Pass	
1.2-Dichloroethane	%	98			70-130	Pass	
Trichloroethene	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	92			70-130	Pass	
TRH C6-C10	%	103			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	122			70-130	Pass	
Acenaphthylene	%	126			70-130	Pass	
Anthracene	%	124			70-130	Pass	
Benz(a)anthracene	%	128			70-130	Pass	
Benzo(a)pyrene	%	118			70-130	Pass	
Benzo(b&j)fluoranthene	%	117			70-130	Pass	
Benzo(g.h.i)perylene	%	127			70-130	Pass	
Benzo(k)fluoranthene	%	127			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chrysene	%	121			70-130	Pass	
Dibenz(a.h)anthracene	%	125			70-130	Pass	
Fluoranthene	%	125			70-130	Pass	
Fluorene	%	124			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	127			70-130	Pass	
Naphthalene	%	119			70-130	Pass	
Phenanthrene	%	120			70-130	Pass	
Pyrene	%	123			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	116			70-130	Pass	
4.4'-DDE	%	88			70-130	Pass	
4.4'-DDT	%	88			70-130	Pass	
a-BHC	%	84			70-130	Pass	
Aldrin	%	81			70-130	Pass	
b-BHC	%	83			70-130	Pass	
d-BHC	%	82			70-130	Pass	
Dieldrin	%	88			70-130	Pass	
Endosulfan I	%	91			70-130	Pass	
Endosulfan II	%	97			70-130	Pass	
Endosulfan sulphate	%	95			70-130	Pass	
Endrin	%	110			70-130	Pass	
Endrin aldehyde	%	104			70-130	Pass	
Endrin ketone	%	100			70-130	Pass	
g-BHC (Lindane)	%	82			70-130	Pass	
Heptachlor	%	86			70-130	Pass	
Heptachlor epoxide	%	90			70-130	Pass	
Hexachlorobenzene	%	82			70-130	Pass	
Methoxychlor	%	76			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	103			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	113			30-130	Pass	
2.4-Dichlorophenol	%	110			30-130	Pass	
2.4.5-Trichlorophenol	%	121			30-130	Pass	
2.4.6-Trichlorophenol	%	124			30-130	Pass	
2.6-Dichlorophenol	%	117			30-130	Pass	
4-Chloro-3-methylphenol	%	120			30-130	Pass	
Pentachlorophenol	%	93			30-130	Pass	
Tetrachlorophenols - Total	%	125			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	73			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	93			30-130	Pass	
2-Methylphenol (o-Cresol)	%	114			30-130	Pass	
2-Nitrophenol	%	122			30-130	Pass	
2.4-Dimethylphenol	%	112			30-130	Pass	
2.4-Dinitrophenol	%	64			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	115			30-130	Pass	
4-Nitrophenol	%	118			30-130	Pass	
Dinoseb	%	93			30-130	Pass	
Phenol	%	115			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	89			70-130	Pass	
LCS - % Recovery							
Chromium (hexavalent)	%	95			70-130	Pass	
Cyanide (total)	%	100			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	103			80-120	Pass	
Arsenic	%	105			80-120	Pass	
Arsenic	%	98			80-120	Pass	
Beryllium	%	105			80-120	Pass	
Boron	%	105			80-120	Pass	
Cadmium	%	107			80-120	Pass	
Cadmium	%	101			80-120	Pass	
Chromium	%	107			80-120	Pass	
Chromium	%	101			80-120	Pass	
Cobalt	%	110			80-120	Pass	
Copper	%	108			80-120	Pass	
Copper	%	103			80-120	Pass	
Lead	%	111			80-120	Pass	
Lead	%	104			80-120	Pass	
Manganese	%	101			80-120	Pass	
Mercury	%	84			75-125	Pass	
Molybdenum	%	111			80-120	Pass	
Molybdenum	%	105			80-120	Pass	
Nickel	%	110			80-120	Pass	
Nickel	%	103			80-120	Pass	
Selenium	%	101			80-120	Pass	
Selenium	%	96			80-120	Pass	
Silver	%	104			80-120	Pass	
Silver	%	96			80-120	Pass	
Tin	%	109			80-120	Pass	
Tin	%	103			80-120	Pass	
Vanadium	%	103			80-120	Pass	
Zinc	%	111			80-120	Pass	
Zinc	%	103			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Manganese	M16-Au27186	NCP	%	92			75-125	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M16-Au26155	NCP	%	78			70-130	Pass	
Toluene	M16-Au26155	NCP	%	83			70-130	Pass	
Ethylbenzene	M16-Au26155	NCP	%	87			70-130	Pass	
m&p-Xylenes	M16-Au26155	NCP	%	88			70-130	Pass	
o-Xylene	M16-Au26155	NCP	%	89			70-130	Pass	
Xylenes - Total	M16-Au26155	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M16-Au26155	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	M16-Au26936	CP	%	108			70-130	Pass	
Acenaphthylene	M16-Au26936	CP	%	111			70-130	Pass	
Anthracene	M16-Au26936	CP	%	112			70-130	Pass	
Benz(a)anthracene	M16-Au26936	CP	%	120			70-130	Pass	
Benzo(a)pyrene	M16-Au26936	CP	%	111			70-130	Pass	
Benzo(b&j)fluoranthene	M16-Au26936	CP	%	105			70-130	Pass	
Benzo(g.h.i)perylene	M16-Au26936	CP	%	124			70-130	Pass	
Benzo(k)fluoranthene	M16-Au26936	CP	%	123			70-130	Pass	
Chrysene	M16-Au26936	CP	%	107			70-130	Pass	
Dibenz(a.h)anthracene	M16-Au26936	CP	%	122			70-130	Pass	
Fluoranthene	M16-Au26936	CP	%	114			70-130	Pass	
Fluorene	M16-Au26936	CP	%	105			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M16-Au26936	CP	%	121			70-130	Pass	
Naphthalene	M16-Au26936	CP	%	105			70-130	Pass	
Phenanthrene	M16-Au26936	CP	%	110			70-130	Pass	
Pyrene	M16-Au26936	CP	%	113			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M16-Au26210	NCP	%	125			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M16-Au26936	CP	%	114			30-130	Pass	
2.4-Dichlorophenol	M16-Au26936	CP	%	110			30-130	Pass	
2.4.5-Trichlorophenol	M16-Au26936	CP	%	122			30-130	Pass	
2.4.6-Trichlorophenol	M16-Au26936	CP	%	120			30-130	Pass	
2.6-Dichlorophenol	M16-Au26936	CP	%	111			30-130	Pass	
4-Chloro-3-methylphenol	M16-Au26936	CP	%	118			30-130	Pass	
Pentachlorophenol	M16-Au26936	CP	%	89			30-130	Pass	
Tetrachlorophenols - Total	M16-Au26936	CP	%	121			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M16-Au26936	CP	%	53			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M16-Au26936	CP	%	53			30-130	Pass	
2-Methylphenol (o-Cresol)	M16-Au26936	CP	%	111			30-130	Pass	
2-Nitrophenol	M16-Au26936	CP	%	112			30-130	Pass	
2.4-Dimethylphenol	M16-Au26936	CP	%	83			30-130	Pass	
2.4-Dinitrophenol	M16-Au26936	CP	%	51			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M16-Au26936	CP	%	111			30-130	Pass	
4-Nitrophenol	M16-Au26936	CP	%	106			30-130	Pass	
Dinoseb	M16-Au26936	CP	%	86			30-130	Pass	
Phenol	M16-Au26936	CP	%	116			30-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	M16-Au28019	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	M16-Au26936	CP	%	99			70-130	Pass	
Arsenic	M16-Au26936	CP	%	104			75-125	Pass	
Beryllium	M16-Au26936	CP	%	103			75-125	Pass	
Boron	M16-Au26936	CP	%	99			75-125	Pass	
Cadmium	M16-Au26936	CP	%	105			75-125	Pass	
Chromium	M16-Au26936	CP	%	99			75-125	Pass	
Cobalt	M16-Au26936	CP	%	99			75-125	Pass	
Copper	M16-Au26936	CP	%	108			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	M16-Au26936	CP	%	87			75-125	Pass	
Mercury	M16-Au26936	CP	%	92			70-130	Pass	
Molybdenum	M16-Au26936	CP	%	107			75-125	Pass	
Nickel	M16-Au26936	CP	%	98			75-125	Pass	
Selenium	M16-Au26936	CP	%	91			75-125	Pass	
Silver	M16-Au26936	CP	%	99			75-125	Pass	
Tin	M16-Au26936	CP	%	83			75-125	Pass	
Vanadium	M16-Au26936	CP	%	99			75-125	Pass	
Zinc	M16-Au26936	CP	%	86			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M16-Au26937	CP	%	93			70-130	Pass	
TRH C10-C14	M16-Au26937	CP	%	103			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M16-Au26735	NCP	%	75			70-130	Pass	
1.1.1-Trichloroethane	M16-Au26735	NCP	%	78			70-130	Pass	
1.2-Dichlorobenzene	M16-Au26735	NCP	%	91			70-130	Pass	
1.2-Dichloroethane	M16-Au26735	NCP	%	84			70-130	Pass	
Trichloroethene	M16-Au26735	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	M16-Au26937	CP	%	86			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M16-Au26937	CP	%	101			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chromium (hexavalent)	M16-Au26744	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M16-Au26941	CP	%	111			70-130	Pass	
4.4'-DDE	M16-Au26941	CP	%	100			70-130	Pass	
4.4'-DDT	M16-Au26941	CP	%	71			70-130	Pass	
a-BHC	M16-Au26941	CP	%	98			70-130	Pass	
Aldrin	M16-Au26941	CP	%	92			70-130	Pass	
b-BHC	M16-Au26941	CP	%	111			70-130	Pass	
d-BHC	M16-Au26941	CP	%	93			70-130	Pass	
Dieldrin	M16-Au26941	CP	%	108			70-130	Pass	
Endosulfan I	M16-Au26941	CP	%	101			70-130	Pass	
Endosulfan II	M16-Au26941	CP	%	100			70-130	Pass	
Endosulfan sulphate	M16-Au26941	CP	%	97			70-130	Pass	
Endrin	M16-Au26941	CP	%	109			70-130	Pass	
Endrin aldehyde	M16-Au26941	CP	%	106			70-130	Pass	
Endrin ketone	M16-Au26941	CP	%	112			70-130	Pass	
g-BHC (Lindane)	M16-Au26941	CP	%	97			70-130	Pass	
Heptachlor	M16-Au26941	CP	%	103			70-130	Pass	
Heptachlor epoxide	M16-Au26941	CP	%	100			70-130	Pass	
Hexachlorobenzene	M16-Au26941	CP	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	M16-Au26933	CP	mg/kg	< 10	11	13	30%	Pass	
Arsenic	M16-Au26933	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M16-Au26933	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M16-Au26933	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M16-Au26933	CP	mg/kg	15	14	6.0	30%	Pass	
Chromium	M16-Au26933	CP	mg/kg	20	25	20	30%	Pass	
Cobalt	M16-Au26933	CP	mg/kg	8.0	9.7	20	30%	Pass	
Copper	M16-Au26933	CP	mg/kg	60	67	11	30%	Pass	
Lead	M16-Au26933	CP	mg/kg	2000	2200	13	30%	Pass	
Manganese	M16-Au26933	CP	mg/kg	390	410	5.0	30%	Pass	
Mercury	M16-Au26933	CP	mg/kg	0.9	0.8	13	30%	Pass	
Molybdenum	M16-Au26933	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M16-Au26933	CP	mg/kg	10	13	25	30%	Pass	
Selenium	M16-Au26933	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M16-Au26933	CP	mg/kg	0.4	< 0.2	200	30%	Fail	Q15
Tin	M16-Au26933	CP	mg/kg	280	300	10	30%	Pass	
Vanadium	M16-Au26933	CP	mg/kg	20	21	9.0	30%	Pass	
Zinc	M16-Au26933	CP	mg/kg	17000	18000	2.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M16-Au26935	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M16-Au26935	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M16-Au26935	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M16-Au26935	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M16-Au26935	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M16-Au26935	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M16-Au26935	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M16-Au26935	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M16-Au26935	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2.4-Dimethylphenol	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M16-Au26935	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M16-Au26935	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M16-Au26935	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M16-Au26935	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M16-Au26935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M16-Au26936	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M16-Au26936	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M16-Au26936	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M16-Au26936	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M16-Au26936	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M16-Au26936	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M16-Au26936	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M16-Au26936	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M16-Au26936	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M16-Au26936	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M16-Au26936	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M16-Au26936	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M16-Au28050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	M16-Au28050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	M16-Au28050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	M16-Au28050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	M16-Au28050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	M16-Au28050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	M16-Au28050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	M16-Au28050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M16-Au28050	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M16-Au28050	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M16-Au28050	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	M16-Au28050	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	M16-Au28050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	M16-Au28050	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M16-Au28050	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	M16-Au28050	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	M16-Au28050	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	M16-Au28050	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M16-Au26936	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M16-Au26936	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M16-Au26936	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M16-Au26904	NCP	mg/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	M16-Au26936	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	M16-Au26936	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Beryllium	M16-Au26936	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M16-Au26936	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M16-Au26936	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M16-Au26936	CP	mg/kg	20	20	1.0	30%	Pass	
Cobalt	M16-Au26936	CP	mg/kg	11	11	1.0	30%	Pass	
Copper	M16-Au26936	CP	mg/kg	15	15	<1	30%	Pass	
Lead	M16-Au26936	CP	mg/kg	51	51	2.0	30%	Pass	
Mercury	M16-Au26936	CP	mg/kg	0.1	0.1	8.0	30%	Pass	
Molybdenum	M16-Au26936	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M16-Au26936	CP	mg/kg	9.6	9.6	<1	30%	Pass	
Selenium	M16-Au26936	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M16-Au26936	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M16-Au26936	CP	mg/kg	16	16	1.0	30%	Pass	
Vanadium	M16-Au26936	CP	mg/kg	24	24	1.0	30%	Pass	
Zinc	M16-Au26936	CP	mg/kg	76	75	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	M16-Au26743	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
pH (1:5 Aqueous extract)	M16-Au26907	NCP	pH Units	3.8	3.8	pass	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M16-Au26938	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M16-Au26938	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M16-Au26938	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M16-Au26938	CP	%	18	17	8.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M16-Au26944	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M16-Au26944	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M16-Au26944	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M16-Au26944	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M16-Au26944	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M16-Au26944	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M16-Au26944	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.4-Trichlorobenzene	M16-Au26944	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Hexachlorobutadiene	M16-Au26944	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
1.1-Dichloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1-Dichloroethene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1-Trichloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2-Trichloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dibromoethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichlorobenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2-Dichloropropane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.3-Trichloropropane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.2.4-Trimethylbenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichlorobenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3-Dichloropropane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.3.5-Trimethylbenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
1.4-Dichlorobenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Butanone (MEK)	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
2-Propanone (Acetone)	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Chlorotoluene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Allyl chloride	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromobenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromochloromethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromodichloromethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromoform	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Bromomethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon disulfide	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Carbon Tetrachloride	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chlorobenzene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloroform	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Chloromethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.2-Dichloroethene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
cis-1.3-Dichloropropene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromochloromethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dibromomethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dichlorodifluoromethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Iodomethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Isopropyl benzene (Cumene)	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methylene Chloride	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Styrene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Tetrachloroethene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
trans-1.2-Dichloroethene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
trans-1.3-Dichloropropene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichloroethene	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Trichlorofluoromethane	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Vinyl chloride	M16-Au26944	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M16-Au26944	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M16-Au26944	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M16-Au26949	CP	%	11	10	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Rhys Thomas	Senior Analyst-Asbestos (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

Attention:	- Rebecca Lucock
Report	513565-AID
Project Name	KENT TOWN
Project ID	371768
Received Date	Aug 29, 2016
Date Reported	Sep 06, 2016

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name KENT TOWN
Project ID 371768
Date Sampled Aug 25, 2016 to Aug 26, 2016
Report 513565-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SB02/1_0.05-0.2	16-Au26934	Aug 25, 2016	Approximate Sample 88g Sample consisted of: Light brown coarse grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
SB14/2_0.3-0.4	16-Au26948	Aug 26, 2016	Approximate Sample 73g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Sep 02, 2016	Indefinite

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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Project Name: KENT TOWN
Project ID: 371768

Order No.:
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Phone: 08 7325 7325
Fax:

Received: Aug 29, 2016 4:27 PM
Due: Sep 5, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	BTEX	Metals M18	Volatile Organics	Moisture Set	Vic EPA Short Screen	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	SB01/2_0.6-0.7	Aug 25, 2016		Soil	M16-Au26933						X		X		
2	SB02/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26934	X									
3	SB03/2_0.4-0.5	Aug 25, 2016		Soil	M16-Au26935			X					X		
4	SB04/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26936								X	X	
5	SB05/5_2.9-3.0	Aug 25, 2016		Soil	M16-Au26937								X		X
6	SB06/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26938								X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
7	SB04/6_5.9-6.0	Aug 25, 2016		Soil	M16-Au26939							X	X		
8	SB08/2_1.0-1.1	Aug 25, 2016		Soil	M16-Au26940						X		X		
9	SB10/1_0.1-0.2	Aug 25, 2016		Soil	M16-Au26941				X				X		
10	SB11/1_0.09-0.2	Aug 25, 2016		Soil	M16-Au26942				X				X		
11	QC04_25/8/16	Aug 25, 2016		Soil	M16-Au26943						X		X		
12	SB07/5_5.0-5.1	Aug 26, 2016		Soil	M16-Au26944							X	X		
13	SB12/1_0.09-0.2	Aug 26, 2016		Soil	M16-Au26945				X				X		
14	SB13/2_0.25-	Aug 26, 2016		Soil	M16-Au26946								X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.35														
15	SB14/1_0.12-0.22	Aug 26, 2016		Soil	M16-Au26947				X				X		
16	SB14/2_0.3-0.4	Aug 26, 2016		Soil	M16-Au26948	X									
17	SB15/3_0.3-0.4	Aug 26, 2016		Soil	M16-Au26949								X	X	
18	RIN01_25/8/16	Aug 25, 2016		Water	M16-Au26950						X				
19	RIN02_26/8/16	Aug 26, 2016		Water	M16-Au26951						X				
20	TRIP01_25/8/16	Aug 25, 2016		Water	M16-Au26952					X					
21	SB01/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26953		X								
22	SB01/3_1.0-	Aug 25, 2016		Soil	M16-Au26954		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	1.1														
23	SB01/4_1.9-2.0	Aug 25, 2016		Soil	M16-Au26955		X								
24	SB02/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26956		X								
25	SB02/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26957		X								
26	SB02/4_1.7-1.8	Aug 25, 2016		Soil	M16-Au26958		X								
27	SB03/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26959		X								
28	SB03/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26960		X								
29	SB04/1_0.05-	Aug 25, 2016		Soil	M16-Au26961		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.2														
30	SB04/3_1.1-1.2	Aug 25, 2016		Soil	M16-Au26962		X								
31	SB05/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26963		X								
32	SB05/2_0.3-0.4	Aug 25, 2016		Soil	M16-Au26964		X								
33	SB05/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26965		X								
34	SB05/4_2.0-2.1	Aug 25, 2016		Soil	M16-Au26966		X								
35	SB06/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26967		X								
36	SB06/3_0.9-	Aug 25, 2016		Soil	M16-Au26968		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	1.0														
37	SB06/4_1.4-1.5	Aug 25, 2016		Soil	M16-Au26969		X								
38	SB07/1_0.05-0.2	Aug 25, 2016		Soil	M16-Au26970		X								
39	SB07/2_0.4-0.5	Aug 25, 2016		Soil	M16-Au26971		X								
40	SB07/3_1.0-1.1	Aug 25, 2016		Soil	M16-Au26972		X								
41	SB04/4_4.3-4.4	Aug 25, 2016		Soil	M16-Au26973		X								
42	SB04/5_4.5-4.6	Aug 25, 2016		Soil	M16-Au26974		X								
43	SB08/1_0.2-	Aug 25, 2016		Soil	M16-Au26975		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.3														
44	SB08/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26976		X								
45	SB09/1_0.2-0.3	Aug 25, 2016		Soil	M16-Au26977		X								
46	SB09/2_0.9-1.0	Aug 25, 2016		Soil	M16-Au26978		X								
47	SB09/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26979		X								
48	SB10/2_1.1-1.2	Aug 25, 2016		Soil	M16-Au26980		X								
49	SB10/3_1.4-1.5	Aug 25, 2016		Soil	M16-Au26981		X								
50	SB11/2_0.8-	Aug 25, 2016		Soil	M16-Au26982		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
	0.9														
51	SB11/3_1.7-1.8	Aug 25, 2016		Soil	M16-Au26983		X								
52	QC01_25/8/16	Aug 25, 2016		Soil	M16-Au26984		X								
53	QC02_25/8/16	Aug 25, 2016		Soil	M16-Au26985		X								
54	QC03_25/8/16	Aug 25, 2016		Soil	M16-Au26986		X								
55	QC05_25/8/16	Aug 25, 2016		Soil	M16-Au26987		X								
56	QC06_25/8/16	Aug 25, 2016		Soil	M16-Au26988		X								
57	QC07_25/8/16	Aug 26, 2016		Soil	M16-Au26989		X								
58	SB07/4_3.0-3.1	Aug 26, 2016		Soil	M16-Au26990		X								
59	SB07/6_6.9-7.0	Aug 26, 2016		Soil	M16-Au26991		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
60	SB12/2_0.45-0.55	Aug 26, 2016		Soil	M16-Au26992		X								
61	SB12/3_1.1-1.2	Aug 26, 2016		Soil	M16-Au26993		X								
62	SB13/1_0.09-0.2	Aug 26, 2016		Soil	M16-Au26994		X								
63	SB13/3_0.4-0.5	Aug 26, 2016		Soil	M16-Au26995		X								
64	SB13/4_1.0-1.1	Aug 26, 2016		Soil	M16-Au26996		X								
65	SB14/3_0.6-0.7	Aug 26, 2016		Soil	M16-Au26997		X								
66	SB14/4_1.2-1.3	Aug 26, 2016		Soil	M16-Au26998		X								

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Company Name: Mott MacDonald
Address: Mezzanine Level, 22 King William St
Adelaide
SA 5000

Project Name: KENT TOWN
Project ID: 371768

Order No.:
Report #: 513565
Phone: 08 7325 7325
Fax:

Received: Aug 29, 2016 4:27 PM
Due: Sep 5, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	BTEX	Metals M18	Volatile Organics	Moisture Set	Vic EPA Short Screen	Vic EPA IWRG 621 (Solids)
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X									
Brisbane Laboratory - NATA Site # 20794															
External Laboratory															
67	SB15/1_0.0-0.1	Aug 26, 2016		Soil	M16-Au26999		X								
68	SB15/2_0.1-0.3	Aug 26, 2016		Soil	M16-Au27000		X								
69	SB15/4_0.85-0.95	Aug 26, 2016		Soil	M16-Au27001		X								
70	SB15/5_1.5-1.6	Aug 26, 2016		Soil	M16-Au27002		X								
Test Counts						2	50	1	4	1	5	2	15	4	1

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The samples received were not collected in approved asbestos bags and were therefore sub-sampled from the 250mL glass jars. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Rhys Thomas Senior Analyst-Asbestos (NSW)



Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab

☐ Eurofins | mgt Brisbane Lab

☐ Eurofins | mgt Melbourne Lab

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☐ 5 DAY (Std) ☐ Other ( ) * Surcharges apply
Special Direction	cc: ashley.moore@mottmac.com						
Relinquished by (Signature)	Bridy Baney					Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal
(Time / Date)	4pm 26/8/16						

Analysis (Note if samples are suspected of containing Asbestos, please specify 'Trace' or 'Fibres')

PAH, HM (18), Asbestos (Presence/Absence), Vic EPP short screen

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL vial; 125mL Amber Glass; Jar

№	Client Sample ID	Date	Matrix	Jar	Sample Comments / DG Hazard Warning
1	SB01/1_0.05-0.2	25/8/16	SOIL	1	
2	SB01/2_0.6-0.7			1	
3	SB01/3_1.0-1.1			1	
4	SB01/4_1.9-2.0			1	
5	SB02/1_0.05-0.2			1	
6	SB02/2_0.3-0.4			1	
7	SB02/3_1.0-1.1			1	
8	SB02/4_1.7-1.8			1	
9	SB03/1_0.05-0.2			1	
10	SB03/2_0.4-0.5			1	
11	SB03/3_1.0-1.1			1	
12	SB04/1_0.05-0.2			1	

Laboratory Use Only									
Received By	Pasfinal	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3.45pm	Signature		Temperature
Received By	SB	SYD | BNE | (MEL) | PER | ADL | NEW | DAR	Date	29/8/16	Time	4.27pm	Signature		Report № 513565

053209_R4 Melbourne S Kayne Adelaide T Lakeland Approved on 11 August 2015

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab

☐ Eurofins | mgt Brisbane Lab

☐ Eurofins | mgt Melbourne Lab

Company	Mott Mac Donald	Purchase Order		Project Manager	Rebecca Lucock
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768
Contact Name	Rebecca Lucock				
Contact Phone №	(08) 7325 7358				
Special Direction	cc: ashley.moore@mottmac.com				
Relinquished by (Signature)	Bridy Baney				
(Time / Date)	4pm 26/8/16				

Project Name	Kent Town
Electronic Results Format	
Email for Results	rebecca.lucock@mottmac.com
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* (* Surcharges apply) ☐ 5 DAY (Std.) ☐ Other ( )

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Analysis (Note if other results are required please specify 'Total' or 'Filtered')															Sample Comments / DG Hazard Warning
				Short Vic EPA suite	RI Vic EPA														
1	SB04/2_0.3-0.4	25/8/16	SOIL	/													1		
2	SB04/3_1.1-1.2																1		
3	SB05/1_0.05-0.2																1		
4	SB05/2_0.3-0.4																1		
5	SB05/3_1.0-1.1																1		
6	SB05/4_2.0-2.1																1		
7	SB05/5_2.9-3.0				/												1		
8	SB06/1_0.05-0.2																1		
9	SB06/2_0.3-0.4			/													1		
10	SB06/3_0.9-1.0																1		
11	SB06/4_1.4-1.5	↓	↓														1		
12	SB07/1_0.05-0.2																1		

Laboratory Use Only										
Received By	Parkinal	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature	
Received By	SB	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	29/8/16	Time	4:27pm	Signature		Report №	517565

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Eurofins | mgt Brisbane Lab

☐ Eurofins | mgt Melbourne Lab

Company	Mott Mac Donald	Purchase Order		Project Manager	Rebecca Lucotik
Address	LM 22 King William St Adelaide, 5000	Eurofins | mgt Quote No		Project No	371768
Contact Name	Rebecca Lucock				
Contact Phone No	(08) 7325 7358				
Special Direction	cc: ashley.mackie@mottmac.com				
Relinquished by (Signature)	Briely Berry				
(Time / Date)	4pm 26/8/16				

Project Name	Kent Town
Electronic Results Format	
Email for Results	rebecca.lucock@mottmac.com
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std) ☐ Other ( )

Containers / Method of Shipment

☐ Courier (#)
☐ Hand Delivered
☐ Postal

No	Client Sample ID	Date	Matrix	Analysis (Note: Where no analysis is selected, please specify Total or Filtered)								Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
				ocp	VOC	Short list TRH/BTEX	HM (15)												
1	SB07/2_0.4-0.5	25/8/16	SOIL															1	
2	SB07/3_1.0-1.1																	1	
3	SB04/4_4.3-4.4																	1	
4	SB04/5_4.5-4.6																	1	
5	SB04/6_5.9-6.0				/													1	
6	SB08/1_0.2-0.3																	1	
7	SB08/2_1.0-1.1					/												1	
8	SB08/3_1.4-1.5																	1	
9	SB09/1_0.2-0.3																	1	
10	SB09/2_0.9-1.0																	1	
11	SB09/3_1.4-1.5																	1	
12	SB10/1_0.1-0.2			/														1	

Laboratory Use Only							
Received By	Pakeman	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature
Received By	SO	SYD | BNE (MEL) | PER | ADL | NEW | DAR	Date	29/8/16	Time	4:27pm	Signature

Temperature:

Report No: 513565

QS3109_R4 Modified by S Keyte Approved by T Lambert Approved on 11 August 2015

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Eurofins | mgt Sydney Lab — Unit 5 Building 7, 16 Mars Road, Lane Cove West NSW 2066 — (02) 9900 8400 — E: EnviroSales@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab — 21 Smallwood Place, Murarrie QLD 4172 — (07) 3902 4600 — E: EnviroSales@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab — 2 Kingston Town Close, Oakleigh VIC 3166 — (03) 8564 5000 — E: EnviroSales@eurofins.com.au

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote Nº		Project Nº	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone Nº	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☐ 5 DAY (Std) ☐ Other ( ) * Surcharges apply
Special Direction	CC: ashley.moule@mottmac.com						
Relinquished by (Signature)	Brady Barey						
(Time / Date)	4pm 26/8/16						

Analytes (Place 'X' in box to indicate analytes required, please specify 'Total' or 'Filtered'): HM (18), BOAS

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Nº	Client Sample ID	Date	Matrix	Sample Comments / DG Hazard Warning
1	SB10/2_1.1-1.2	25/8/16	SOIL	
2	SB10/3_1.4-1.5			
3	SB11/1_0.09-0.2			
4	SB11/2_0.8-0.9			
5	SB11/3_1.7-1.8			
6	QC01_25/8/16			
7	QC02_25/8/16			
8	QC03_25/8/16			
9	QC04_25/8/16			
10	QC05_25/8/16			
11	QC06_25/8/16			
12	QC07_26/8/16	26/8/16		

Laboratory Use Only									
Received By	Paz Rimal	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature	
Received By	SB	SYD | BNE | (MEL) | PER | ADL | NEW | DAR	Date	29/8/16	Time	4:27pm	Signature		Report Nº	535655

QSC009_R4 Reviewed by S Kapral Approved by T Lakeland Approved on 11 August 2015

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Eurofins | mgt Brisbane Lab

☐ Eurofins | mgt Melbourne Lab

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	377168
Contact Name	Rebecca Lucock				
Contact Phone №	(08) 7325 7358				
Special Direction	cc: ashley.moode@mottmac.com				
Relinquished by (Signature)	Bridy Carey				
(Time / Date)	4pm 26/8/16				

Project Name	Kent Town	
Electronic Results Format		
Email for Results	rebecca.lucock@mottmac.com	
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std) ☐ Other ( )	
Containers		Method of Shipment
		☐ Courier (#) ☐ Hand Delivered ☐ Postal
		Sample Comments / DG Hazard Warning

Analysis (Please check marks to correspond with boxes listed at "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	6OCP	VOC	HMC(s)	Short VIC Brief Screen
1	QC08_26/8/16	26/8/16	SOIL			✓	
2	SB07/4_3.0-3.1	↓	↓				
3	SB07/5_5.0-5.1				✓		
4	SB07/6_6.9-7.0						
5	SB12/1_0.09-0.2			✓			
6	SB12/2_0.45-0.55						
7	SB12/3_1.1-1.2						
8	SB13/1_0.09-0.2						
9	SB13/2_0.25-0.35						✓
10	SB13/3_0.4-0.5						
11	SB13/4_1.0-1.1						
12	SB14/1_0.12-0.22			✓			

Laboratory Use Only									
Received By	Pagrunal	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3.45pm	Signature		Temperature
Received By	GS	SYD | BNE (MEL) | PER | ADL | NEW | DAR	Date	29/8/16	Time	4.07pm	Signature		Report № 517565

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Eurofins | mgt Brisbane Lab

☐ Eurofins | mgt Melbourne Lab

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Onote №		Project №	371768
Contact Name	Rebecca Lucock				
Contact Phone №	(08) 7325 7358				
Special Direction	cc: ashley.maide@mottmac.com				
Relinquished by (Signature)	Bridy Barry				
(Time / Date)	4 pm 26/8/16				

Project Name	Kent Town
Electronic Results Format	
Email for Results	rebecca.lucock@mottmac.com
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )

Containers

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify Total or Filtered)

№	Client Sample ID	Date	Matrix	6 Cr+	HM (18)	R6 NC EPA - short-suite	BTEX	PAH	TRH	Asbestos (presence/absence)	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	SB14/2_0.3-0.4	26/8/16	Soil							/							1	
2	SB14/3_0.6-0.7																1	
3	SB14/4_1.2-1.3																1	
4	SB15/1_0.0-0.1																1	
5	SB15/2_0.1-0.3																1	
6	SB15/3_0.3-0.4					/											1	
7	SB15/4_0.85-0.95																1	
8	SB15/5_1.5-1.6	↓	↓														1	
9	RIN01_25/8/16	25/8/16	WATER		/								1		2	1		
10	RIN02_26/8/16	26/8/16	↓		/								1		2	1		
11	Trip01_25/8/16	25/8/16	↓				/								1			
12																		

Laboratory Use Only										
Received By	Paul Rinaldi	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3.45pm	Signature		Temperature	
Received By	SB	SYD | BNE (MEL) | PER | ADL | NEW | DAR	Date	29/8/16	Time	9.27	Signature		Report №	513565

DS3000_R4 Modified by S Kayne Approved by T Eaglard Approved on 11 August 2015

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Eurofins | mgt Brisbane Lab

☐ Eurofins | mgt Melbourne Lab

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucotik
Address	LM 22 King William St Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768
Contact Name	Rebecca Lucock				
Contact Phone №	(08) 7325 7358				
Special Direction	cc: ashley.moate@mottmac.com				
Relinquished by (Signature)	Brady Carey				
(Time / Date)	4pm 26/8/16				

Project Name	Kent Town				
Electronic Results Format					
Email for Results	rebecca.lucock@mottmac.com				
Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std) ☐ Other ( )				
Containers	1L Plastic; 250mL Plastic; 125mL Amber Glass; 250mL Amber Glass; 40mL vial; 125mL Amber Glass; Jar				
Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal				

Analysis (* please indicate required fractionation in Comments, e.g. 0.04mm)

№	Client Sample ID	Date	Matrix	6GP	VOC	HM(18)	Short list Suite Screen	Sample Comments / DG Hazard Warning
1	QC08_26/8/16	26/8/16	SOIL			/		
2	SB07/4_3.0-3.1							
3	SB07/5_5.0-5.1				/			
4	SB07/6_6.9-7.0							
5	SB12/1_0.09-0.2			/				
6	SB12/2_0.45_0.55							
7	SB12/3_1.1-1.2							
8	SB13/1_0.09-0.2							
9	SB13/2_0.25-0.35						/	
10	SB13/3_0.4-0.5							
11	SB13/4_1.0-1.1							
12	SB14/1_0.12-0.22			/				

Laboratory Use Only									
Received By	Paul Ismail	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3.45pm	Signature		Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

COPY

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Eurofins | mgt Sydney Lab

Eurofins | mgt Brisbane Lab

Eurofins | mgt Melbourne Lab

COPY

Company	Mott MacDonald	Purchase Order	
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Onote №	
Contact Name	Rebecca Lucock	Project Manager	Rebecca Lucock
Contact Phone №	(08) 7325 7358	Project №	371763
Special Direction	cc: ashley.maide@mottmac.com	Project Name	Kent Town
Relinquished by (Signature)	Bridy Barcy	Electronic Results Format	
(Time / Date)	4 pm 26/8/16	Email for Results	rebecca.lucock@mottmac.com
		Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )

Analysis (Note: Where results are requested, please specify "Total" or "Dissolved")

№	Client Sample ID	Date	Matrix	6 Cr +	HM (18)	R6 VIC EPA - short-suite	BTEX	PAH	TRH	Asbestos (Presence / Absence)
1	SB14/2_0.3-0.4	24/8/16	Soil							/
2	SB14/3_0.6-0.7									
3	SB14/4_1.2-1.3									
4	SB15/1_0.0-0.1									
5	SB15/2_0.1-0.3									
6	SB15/3_0.3-0.4					/				
7	SB15/4_0.85-0.95									
8	SB15/5_1.5-1.6	↓	↓							
9	RIN01_25/8/16	25/8/16	Water		/					
10	RIN02_26/8/16	26/8/16	↓		/					
11	Trip01_25/8/16	25/8/16	↓				/			
12										

Containers

1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar
						1
						1
						1
						1
						1
						1
						1
						1
		1		2	1	
		1		2	1	
				1		

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Sample Comments / DG Hazard Warning

Laboratory Use Only									
Received By	Rachael	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	26/8/16	Time	3.45pm	Signature		Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

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AU02_USR_LAB00020

From: Lucock, Rebecca K <Rebecca.Lucock@mottmac.com>
Sent: Monday, 29 August 2016 4:27 PM
To: AU02_USR_LAB00020
Cc: Moule, Ashley C; Mary Makarios
Subject: RE: Kent Town - Please advise testing
Attachments: 29082016165523-0001.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hi Rob,

Please find attached the completed COC.

Kind regards,

Rebecca

Rebecca Lucock
BEnvSci(Adv)Hons
Senior Environmental Scientist

D +61 (0)8 7325 7358 T +61 (0)8 7325 7325 F +61 (0)8 8221 7007
Rebecca.lucock@mottmac.com

Mott MacDonald
22 King William Street
Adelaide SA 5000
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Australia

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From: AU02_USR_LAB00020 [mailto:EnviroSampleVic@eurofins.com]
Sent: Monday, 29 August 2016 10:29 AM
To: Lucock, Rebecca K <Rebecca.Lucock@mottmac.com>
Cc: Moule, Ashley C <Ashley.Moule@mottmac.com>
Subject: Kent Town - Please advise testing

Hello Rebecca,

Please advise on testing for the attached COC.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )
Special Direction	cc: ashley.moore@mottmac.com						
Relinquished by (Signature)	Bridy Baney						
(Time / Date)	4pm 26/8/16						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL Vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Jar	Sample Comments / DG Hazard Warning
1	SB01/1_0.05-0.2	25/8/16	SOIL	1	
2	SB01/2_0.6-0.7			1	
3	SB01/3_1.0-1.1			1	
4	SB01/4_1.9-2.0			1	
5	SB02/1_0.05-0.2			1	
6	SB02/2_0.3-0.4			1	
7	SB02/3_1.0-1.1			1	
8	SB02/4_1.7-1.8			1	
9	SB03/1_0.05-0.2			1	
10	SB03/2_0.4-0.5			1	
11	SB03/3_1.0-1.1			1	
12	SB04/1_0.05-0.2			1	

Laboratory Use Only									
Received By	Patrunal	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

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☐ Eurofins | mgt Melbourne Lab — 2 Kingston Town Close Oakleigh VIC 3166 P: +61 3 8564 5000 F: +61 3 8564 5090 E: EnviroSampleVic@eurofins.com.au

Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )
Special Direction	CC: ashley.moule@mottmac.com						
Relinquished by (Signature) (Time / Date)	Bridy Baney 4pm 26/8/16						

Analysis (Note: Where metals are required, please specify "Total" or "Filtered")

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Jar	Sample Comments / DG Hazard Warning
1	SB04/2_0.3-0.4	25/8/16	SOIL	1	
2	SB04/3_1.1-1.2			1	
3	SB05/1_0.05-0.2			1	
4	SB05/2_0.3-0.4			1	
5	SB05/3_1.0-1.1			1	
6	SB05/4_2.0-2.1			1	
7	SB05/5_2.9-3.0			1	
8	SB06/1_0.05-0.2			1	
9	SB06/2_0.3-0.4			1	
10	SB06/3_0.9-1.0			1	
11	SB06/4_1.4-1.5			1	
12	SB07/1_0.05-0.2			1	

Laboratory Use Only									
Received By	Paternal	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	26/8/16	Time	3:45PM	Signature		Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

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ABN 50 005 085 521

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Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )
Special Direction	cc: ashley.moore@mottmac.com						
Relinquished by (Signature) (Time / Date)	Brady Barney 4pm 26/8/16						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Jar	Sample Comments / DG Hazard Warning
1	SB07/2_0.4-0.5	25/8/16	SOIL	1	
2	SB07/3_1.0-1.1			1	
3	SB04/4_4.3-4.4			1	
4	SB04/5_4.5-4.6			1	
5	SB04/6_5.9-6.0			1	
6	SB08/1_0.2-0.3			1	
7	SB08/2_1.0-1.1			1	
8	SB08/3_1.4-1.5			1	
9	SB09/1_0.2-0.3			1	
10	SB09/2_0.9-1.0			1	
11	SB09/3_1.4-1.5			1	
12	SB10/1_0.1-0.2			1	

Laboratory Use Only										
Received By	Patrick	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №	

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371763	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )
Special Direction	cc: ashley.moule@mottmac.com						
Relinquished by (Signature) (Time / Date)	Bridy Baney 4pm 26/8/16						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Jar	Sample Comments / DG Hazard Warning
1	SB10/2_1.1-1.2	25/8/16	SOIL	1	
2	SB10/3_1.4-1.5			1	
3	SB11/1_0.09-0.2			1	
4	SB11/2_0.8-0.9			1	
5	SB11/3_1.7-1.8			1	
6	QC01_25/8/16			1	
7	QC02_25/8/16			1	
8	QC03_25/8/16			1	
9	QC04_25/8/16			1	
10	QC05_25/8/16			1	
11	QC06_25/8/16			1	
12	QC07_26/8/16	26/8/16		1	

Laboratory Use Only										
Received By	Pat Rimmel	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №	

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Company	Mott MacDonald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )
Special Direction	cc: ashley.moule@mottmac.com						
Relinquished by (Signature) (Time / Date)	Bridy Carey 4pm 26/8/16						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL vial | 125mL Amber Glass | Jar

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Sample Comments / DG Hazard Warning
1	QC08_26/8/16			
2	SB07/4_3.0-3.1			
3	SB07/5_5.0-5.1			
4	SB07/6_6.9-7.0			
5	SB12/1_0.09-0.2			
6	SB12/2_0.45_0.55			
7	SB12/3_1.1-1.2			
8	SB13/1_0.09-0.2			
9	SB13/2_0.25-0.35			
10	SB13/3_0.4-0.5			
11	SB13/4_1.0-1.1			
12	SB14/1_0.12-0.22			

Laboratory Use Only										
	Received By	Paperwork	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

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Company	Mott Mac Donald	Purchase Order		Project Manager	Rebecca Lucock	Project Name	Kent Town
Address	LM 22 King William ST Adelaide, 5000	Eurofins | mgt Quote №		Project №	371768	Electronic Results Format	
Contact Name	Rebecca Lucock					Email for Results	rebecca.lucock@mottmac.com
Contact Phone №	(08) 7325 7358					Turn Around Requirements	☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* * Surcharges apply ☐ 5 DAY (Std.) ☐ Other ( )
Special Direction	cc: ashley.moule@mottmac.com						
Relinquished by (Signature)	Bridy Baney					Containers	Method of Shipment
(Time / Date)	4:pm 26/8/16						☐ Courier (#) ☐ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	SB14/2_0.3-0.4	26/8/16	Soil							1	
2	SB14/3_0.6-0.7									1	
3	SB14/4_1.2-1.3									1	
4	SB15/1_0.0-0.1									1	
5	SB15/2_0.1-0.3									1	
6	SB15/3_0.3-0.4									1	
7	SB15/4_0.85-0.95									1	
8	SB15/5_1.5-1.6	↓	↓							1	
9	RIN01_25/8/16	25/8/16	WATER			1		2	1		
10	RIN02_26/8/16	26/8/16	↓			1		2	1		
11	Trip01_25/8/16	25/8/16	↓					1			
12											

Laboratory Use Only									
Received By	Paerman	SYD | BNE | MEL | PER | (ADL) | NEW | DAR	Date	26/8/16	Time	3:45pm	Signature		Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №

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Certificate of Analysis

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **- Rebecca Lucock**

Report	**514217-S**
Project name	KENT TOWN
Project ID	371768
Received Date	Sep 02, 2016

Client Sample ID			**SB07/3**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M16-Se02257**
Date Sampled			**Aug 25, 2016**
Test/Reference	LOR	Unit	
% Clay	1	%	58
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	590
pH (1:5 Aqueous extract)	0.1	pH Units	7.7
Total Organic Carbon	0.1	%	0.2
% Moisture	1	%	19
Heavy Metals			
Iron	20	mg/kg	46000
Ion Exchange Properties			
Cation Exchange Capacity	0.05	meq/100g	48

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Clay	Brisbane	Sep 07, 2016	6 Day
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract)	Melbourne	Sep 06, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Sep 06, 2016	28 Day
- Method: APHA 5310B Total Organic Carbon			
Heavy Metals	Melbourne	Sep 05, 2016	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Sep 06, 2016	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	Sep 08, 2016	
% Moisture	Melbourne	Sep 02, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

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2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Mott MacDonald	**Order No.:**		**Received:**	Sep 2, 2016 10:34 AM
Address:	Mezzanine Level, 22 King William St Adelaide SA 5000	**Report #:**	514217	**Due:**	Sep 9, 2016
		Phone:	08 7325 7325	**Priority:**	5 Day
		Fax:		**Contact Name:**	- Rebecca Lucock
Project Name:	KENT TOWN				
Project ID:	371768				

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						% Clay	Iron	pH (1:5 Aqueous extract)	Reverse HOLD Charge	Total Organic Carbon	Moisture Set	Cation Exchange Capacity
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794						X						
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	SB07/3	Aug 25, 2016		Soil	M16-Se02257	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	< 10			10	Pass	
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Iron	mg/kg	< 20			20	Pass	
LCS - % Recovery							
% Clay	%	110			70-130	Pass	
Total Organic Carbon	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M16-Se01711	NCP	%	2.5	2.5	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C)	B16-Se02047	NCP	uS/cm	190	180	3.0	30%	Pass	
pH (1:5 Aqueous extract)	B16-Se02047	NCP	pH Units	8.8	8.7	pass	30%	Pass	
Total Organic Carbon	S16-Au27435	NCP	%	1.2	1.2	3.0	30%	Pass	
% Moisture	M16-Se02257	CP	%	19	19	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	M16-Se01712	NCP	mg/kg	1300	1300	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)



Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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AU02_USR_LAB00020

From: Lucock, Rebecca K <Rebecca.Lucock@mottmac.com>
Sent: Friday, 2 September 2016 10:34 AM
To: AU02_USR_LAB00020
Cc: Mary Makarios
Subject: Kent Town additional analysis
Attachments: 29082016165523-0001.pdf

Hi,

Please could I add the following analysis onto the attached COC:

SB07/3: Fe, CEC, pH, TOC, clay An 26972 hold

Kind regards,

Rebecca

Tony W.
2/9/16 10:34 am
Report: 514217

Rebecca Lucock
BEnvSci(Adv)Hons
Senior Environmental Scientist

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190

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From: Lucock, Rebecca K
Sent: Monday, 29 August 2016 3:57 PM
To: AU02_USR_LAB00020 <EnviroSampleVic@eurofins.com>
Cc: Moule, Ashley C <Ashley.Moule@mottmac.com>; Mary Makarios <MaryMakarios@eurofins.com>
Subject: RE: Kent Town - Please advise testing

Hi Rob,

Please find attached the completed COC.

eurofins | mgt

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Mott MacDonald
Mezzanine Level, 22 King William St
Adelaide
SA 5000

Attention: **- Rebecca Lucock**

Report **514709-S**
Project name KENT TOWN
Project ID 371768
Received Date Sep 07, 2016

Client Sample ID			SB01/3_1.0-1.1	SB15/4_0.85-0.95	SB11/2_0.8-0.9	SB13/3_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Se06043	M16-Se06044	M16-Se06045	M16-Se06046
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	100	-	107
p-Terphenyl-d14 (surr.)	1	%	-	92	-	94

Client Sample ID			SB01/3_1.0-1.1	SB15/4_0.85-0.95	SB11/2_0.8-0.9	SB13/3_0.4-0.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M16-Se06043**	**M16-Se06044**	**M16-Se06045**	**M16-Se06046**
Date Sampled			**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**	**Aug 25, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	-	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	-	108	121	124
Tetrachloro-m-xylene (surr.)	1	%	-	78	80	75
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	-	-
Arsenic	2	mg/kg	18	10	-	-
Beryllium	2	mg/kg	< 2	< 2	-	-
Boron	10	mg/kg	< 10	< 10	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	27	10.0	-	-
Cobalt	5	mg/kg	6.6	5.1	-	-
Copper	5	mg/kg	8.9	10	-	-
Lead	5	mg/kg	16	37	-	-
Manganese	5	mg/kg	200	330	-	-
Mercury	0.1	mg/kg	< 0.1	0.2	-	-
Molybdenum	5	mg/kg	< 5	< 5	-	-
Nickel	5	mg/kg	14	6.2	-	-
Selenium	2	mg/kg	< 2	< 2	-	-
Silver	0.2	mg/kg	< 0.2	< 0.2	-	-
Tin	10	mg/kg	< 10	< 10	-	-
Vanadium	10	mg/kg	33	12	-	-
Zinc	5	mg/kg	23	58	-	-
% Moisture	1	%	14	12	11	9.0

Client Sample ID			SB02/2	SB03/2	SB08/3	SB10/1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Se06047	M16-Se06048	M16-Se06049	M16-Se06050
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	-	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	-	< 50	< 50	110
TRH C29-C36	50	mg/kg	-	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	< 50	110
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	-	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	3.2
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	3.5
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	3.7
Acenaphthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	1.6
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	2.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	< 0.5	2.0
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	2.0
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	1.5
Chrysene	0.5	mg/kg	-	-	< 0.5	1.6
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	-	< 0.5	2.6
Fluorene	0.5	mg/kg	-	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	1.6
Naphthalene	0.5	mg/kg	-	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	-	< 0.5	0.8
Pyrene	0.5	mg/kg	-	-	< 0.5	2.5
Total PAH*	0.5	mg/kg	-	-	< 0.5	18.7
2-Fluorobiphenyl (surr.)	1	%	-	-	103	107
p-Terphenyl-d14 (surr.)	1	%	-	-	94	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-

Client Sample ID			SB02/2	SB03/2	SB08/3	SB10/1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Se06047	M16-Se06048	M16-Se06049	M16-Se06050
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Dibutylchlorendate (surr.)	1	%	-	98	91	-
Tetrachloro-m-xylene (surr.)	1	%	-	104	79	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	-	< 100	< 100	110
TRH >C34-C40	100	mg/kg	-	< 100	< 100	< 100
Heavy Metals						
Antimony	10	mg/kg	< 10	< 10	-	< 10
Arsenic	2	mg/kg	9.5	17	-	14
Beryllium	2	mg/kg	< 2	< 2	-	< 2
Boron	10	mg/kg	< 10	< 10	-	< 10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	16	21	-	12
Cobalt	5	mg/kg	8.1	7.5	-	< 5
Copper	5	mg/kg	12	13	-	29
Lead	5	mg/kg	9.3	66	-	150
Manganese	5	mg/kg	670	210	-	190
Mercury	0.1	mg/kg	< 0.1	0.2	-	0.3
Molybdenum	5	mg/kg	< 5	< 5	-	6.4
Nickel	5	mg/kg	9.6	12	-	7.9
Selenium	2	mg/kg	< 2	< 2	-	< 2
Silver	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tin	10	mg/kg	< 10	< 10	-	< 10
Vanadium	10	mg/kg	19	28	-	11
Zinc	5	mg/kg	25	200	-	590
% Moisture	1	%	13	18	12	14

Client Sample ID			SB12/2	SB07/2	SB14/3
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Se06051	M16-Se06052	M16-Se06053
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5

Client Sample ID			SB12/2	SB07/2	SB14/3
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M16-Se06051	M16-Se06052	M16-Se06053
Date Sampled			Aug 25, 2016	Aug 25, 2016	Aug 25, 2016
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	104	96
p-Terphenyl-d14 (surr.)	1	%	88	104	87
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-
Toxaphene	1	mg/kg	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	92	-
Tetrachloro-m-xylene (surr.)	1	%	-	82	-
% Moisture	1	%	7.4	12	8.2

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 07, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 07, 2016	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Sep 07, 2016	14 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Metals M18	Melbourne	Sep 07, 2016	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Sep 07, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Mott MacDonald
Address: Mezzanine Level, 22 King William St
Adelaide
SA 5000

Project Name: KENT TOWN
Project ID: 371768

Order No.:
Report #: 514709
Phone: 08 7325 7325
Fax:

Received: Sep 7, 2016 10:48 AM
Due: Sep 14, 2016
Priority: 5 Day
Contact Name: - Rebecca Lucock

Eurofins | mgt Analytical Services Manager : Sarah Gould

Sample Detail						Reverse HOLD Charge	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M18	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	SB01/3_1.0-1.1	Aug 25, 2016		Soil	M16-Se06043	X			X	X	
2	SB15/4_0.85-0.95	Aug 25, 2016		Soil	M16-Se06044	X	X	X	X	X	X
3	SB11/2_0.8-0.9	Aug 25, 2016		Soil	M16-Se06045	X		X		X	
4	SB13/3_0.4-0.5	Aug 25, 2016		Soil	M16-Se06046	X	X	X		X	
5	SB02/2	Aug 25, 2016		Soil	M16-Se06047	X			X	X	
6	SB03/2	Aug 25, 2016		Soil	M16-Se06048			X	X	X	X
7	SB08/3	Aug 25, 2016		Soil	M16-Se06049	X	X	X		X	X
8	SB10/1	Aug 25, 2016		Soil	M16-Se06050		X		X	X	X

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Sample Detail						Reverse HOLD Charge	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M18	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
External Laboratory											
9	SB12/2	Aug 25, 2016		Soil	M16-Se06051	X	X			X	
10	SB07/2	Aug 25, 2016		Soil	M16-Se06052	X	X	X		X	
11	SB14/3	Aug 25, 2016		Soil	M16-Se06053	X	X			X	
Test Counts						9	7	6	5	11	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

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%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Antimony	mg/kg	< 10			10	Pass	
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Vanadium	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	121			70-130	Pass	
TRH C10-C14	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	116			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	92			70-130	Pass	
Acenaphthylene	%	108			70-130	Pass	
Anthracene	%	107			70-130	Pass	
Benz(a)anthracene	%	101			70-130	Pass	
Benzo(a)pyrene	%	98			70-130	Pass	
Benzo(b&j)fluoranthene	%	86			70-130	Pass	
Benzo(g.h.i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	112			70-130	Pass	
Chrysene	%	91			70-130	Pass	
Dibenz(a.h)anthracene	%	106			70-130	Pass	
Fluoranthene	%	104			70-130	Pass	
Fluorene	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	95			70-130	Pass	
Phenanthrene	%	99			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	103			70-130	Pass	
4.4'-DDE	%	99			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDT	%	74			70-130	Pass	
a-BHC	%	93			70-130	Pass	
Aldrin	%	90			70-130	Pass	
b-BHC	%	98			70-130	Pass	
d-BHC	%	101			70-130	Pass	
Dieldrin	%	99			70-130	Pass	
Endosulfan I	%	95			70-130	Pass	
Endosulfan II	%	93			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	98			70-130	Pass	
Endrin aldehyde	%	104			70-130	Pass	
Endrin ketone	%	119			70-130	Pass	
g-BHC (Lindane)	%	93			70-130	Pass	
Heptachlor	%	84			70-130	Pass	
Heptachlor epoxide	%	96			70-130	Pass	
Hexachlorobenzene	%	95			70-130	Pass	
Methoxychlor	%	82			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Antimony	%	98			80-120	Pass	
Arsenic	%	105			80-120	Pass	
Beryllium	%	106			80-120	Pass	
Boron	%	94			80-120	Pass	
Cadmium	%	106			80-120	Pass	
Chromium	%	109			80-120	Pass	
Cobalt	%	109			80-120	Pass	
Copper	%	108			80-120	Pass	
Lead	%	107			80-120	Pass	
Manganese	%	113			80-120	Pass	
Mercury	%	96			75-125	Pass	
Molybdenum	%	107			80-120	Pass	
Nickel	%	109			80-120	Pass	
Selenium	%	104			80-120	Pass	
Silver	%	103			80-120	Pass	
Tin	%	105			80-120	Pass	
Vanadium	%	105			80-120	Pass	
Zinc	%	110			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Antimony	B16-Se04580	NCP	%	91			70-130	Pass	
Manganese	M16-Se03202	NCP	%	95			75-125	Pass	
Selenium	B16-Se04580	NCP	%	92			75-125	Pass	
Zinc	M16-Se07538	NCP	%	79			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B16-Se04581	NCP	%	111			70-130	Pass	
TRH C10-C14	M16-Se03688	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	B16-Se04581	NCP	%	80			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C10	B16-Se04581	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M16-Se02432	NCP	%	97			70-130	Pass	
Acenaphthylene	M16-Se02432	NCP	%	117			70-130	Pass	
Anthracene	M16-Se02432	NCP	%	119			70-130	Pass	
Benz(a)anthracene	M16-Se02432	NCP	%	111			70-130	Pass	
Benzo(a)pyrene	M16-Se02432	NCP	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	M16-Se02432	NCP	%	109			70-130	Pass	
Benzo(g.h.i)perylene	M16-Se02432	NCP	%	93			70-130	Pass	
Benzo(k)fluoranthene	M16-Se02432	NCP	%	107			70-130	Pass	
Chrysene	M16-Se02432	NCP	%	97			70-130	Pass	
Dibenz(a.h)anthracene	M16-Se02432	NCP	%	114			70-130	Pass	
Fluoranthene	M16-Se02432	NCP	%	105			70-130	Pass	
Fluorene	M16-Se02432	NCP	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se02432	NCP	%	103			70-130	Pass	
Naphthalene	M16-Se02432	NCP	%	97			70-130	Pass	
Phenanthrene	M16-Se02432	NCP	%	109			70-130	Pass	
Pyrene	M16-Se02432	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M16-Se03688	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M16-Se06048	CP	%	94			70-130	Pass	
4.4'-DDE	M16-Se06048	CP	%	88			70-130	Pass	
4.4'-DDT	M16-Se06048	CP	%	79			70-130	Pass	
a-BHC	M16-Se06048	CP	%	95			70-130	Pass	
Aldrin	M16-Se06048	CP	%	93			70-130	Pass	
b-BHC	M16-Se06048	CP	%	87			70-130	Pass	
d-BHC	M16-Se06048	CP	%	99			70-130	Pass	
Dieldrin	M16-Se06048	CP	%	97			70-130	Pass	
Endosulfan I	M16-Se06048	CP	%	88			70-130	Pass	
Endosulfan II	M16-Se06048	CP	%	86			70-130	Pass	
Endosulfan sulphate	M16-Se06048	CP	%	88			70-130	Pass	
Endrin	M16-Se06048	CP	%	87			70-130	Pass	
Endrin aldehyde	M16-Se06048	CP	%	89			70-130	Pass	
Endrin ketone	M16-Se06048	CP	%	102			70-130	Pass	
g-BHC (Lindane)	M16-Se06048	CP	%	91			70-130	Pass	
Heptachlor	M16-Se06048	CP	%	87			70-130	Pass	
Heptachlor epoxide	M16-Se06048	CP	%	92			70-130	Pass	
Hexachlorobenzene	M16-Se06048	CP	%	88			70-130	Pass	
Methoxychlor	M16-Se06048	CP	%	89			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M16-Se06048	CP	%	81			75-125	Pass	
Beryllium	M16-Se06048	CP	%	82			75-125	Pass	
Boron	M16-Se06048	CP	%	77			75-125	Pass	
Cadmium	M16-Se06048	CP	%	93			75-125	Pass	
Chromium	M16-Se06048	CP	%	79			75-125	Pass	
Cobalt	M16-Se06048	CP	%	77			75-125	Pass	
Copper	M16-Se06048	CP	%	91			75-125	Pass	
Lead	M16-Se06048	CP	%	77			75-125	Pass	
Mercury	M16-Se06048	CP	%	88			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Molybdenum	M16-Se06048	CP	%	91			75-125	Pass	
Nickel	M16-Se06048	CP	%	77			75-125	Pass	
Silver	M16-Se06048	CP	%	95			75-125	Pass	
Tin	M16-Se06048	CP	%	96			75-125	Pass	
Vanadium	M16-Se06048	CP	%	79			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B16-Se04580	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M16-Se03679	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M16-Se03679	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M16-Se03679	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B16-Se04580	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B16-Se04580	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M16-Se08024	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M16-Se03679	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M16-Se03679	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M16-Se03679	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Se06046	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin aldehyde	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M16-Se06046	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M16-Se06046	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	M16-Se06047	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	M16-Se06047	CP	mg/kg	9.5	8.6	10	30%	Pass	
Beryllium	M16-Se06047	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M16-Se06047	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M16-Se06047	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M16-Se06047	CP	mg/kg	16	12	26	30%	Pass	
Cobalt	M16-Se06047	CP	mg/kg	8.1	6.2	26	30%	Pass	
Copper	M16-Se06047	CP	mg/kg	12	9.5	24	30%	Pass	
Lead	M16-Se06047	CP	mg/kg	9.3	12	24	30%	Pass	
Manganese	M16-Se06047	CP	mg/kg	670	620	7.0	30%	Pass	
Mercury	M16-Se06047	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M16-Se06047	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M16-Se06047	CP	mg/kg	9.6	7.9	19	30%	Pass	
Selenium	M16-Se06047	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M16-Se06047	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M16-Se06047	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Vanadium	M16-Se06047	CP	mg/kg	19	15	28	30%	Pass	
Zinc	M16-Se06047	CP	mg/kg	25	28	9.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Antimony	M16-Se06048	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Arsenic	M16-Se06048	CP	mg/kg	17	16	4.0	30%	Pass	
Beryllium	M16-Se06048	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	M16-Se06048	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	M16-Se06048	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M16-Se06048	CP	mg/kg	21	26	22	30%	Pass	
Cobalt	M16-Se06048	CP	mg/kg	7.5	9.3	21	30%	Pass	
Copper	M16-Se06048	CP	mg/kg	13	16	22	30%	Pass	
Lead	M16-Se06048	CP	mg/kg	66	80	20	30%	Pass	
Manganese	M16-Se06048	CP	mg/kg	210	220	5.0	30%	Pass	
Mercury	M16-Se06048	CP	mg/kg	0.2	0.2	4.0	30%	Pass	
Molybdenum	M16-Se06048	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M16-Se06048	CP	mg/kg	12	14	19	30%	Pass	
Selenium	M16-Se06048	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M16-Se06048	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M16-Se06048	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Vanadium	M16-Se06048	CP	mg/kg	28	34	20	30%	Pass	
Zinc	M16-Se06048	CP	mg/kg	200	210	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M16-Se06052	CP	%	12	13	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Sarah Gould	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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G. EIL spreadsheet outputs

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
48
Enter soil pH (calcium chloride method) (values from 1 to 14)
7.7
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
high

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	390
Urban residential and open public spaces	#NUM!	1500
Commercial and industrial	#NUM!	2200

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
58
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
high

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	240
Urban residential and open public spaces	#NUM!	730
Commercial and industrial	#NUM!	1200

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
48
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia
4.6
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
high

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	40	90
Urban residential and open public spaces	170	490
Commercial and industrial	320	830

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
48
Enter soil pH (calcium chloride method) (values from 1 to 14)
7.7
Enter organic carbon content (%OC) (values from 0 to 50%)
0.2
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia
4.6
or for aged ABCs only
Enter State (or closest State)
SA
Enter traffic volume (high or low)
high

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	45	65
Urban residential and open public spaces	80	150
Commercial and industrial	110	200

H. Result summary tables

Description					Heavy Metals & pH																						
Data Reference Number	Sample Number	Date Sampled	Sample Description	pH	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	Manganese	Iron	Beryllium	Cobalt	Boron	Antimony	Vanadium	Chromium (hexavalent)	Cyanide (total)	Fluoride
					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	mg/kg	mg/kg	mg/kg
513565	QC04_25/8/16	25/08/2016	Soil	-	< 2	< 0.4	35	19	12	< 0.1	< 5	21	< 2	< 0.2	< 10	42	220	-	< 2	9.6	< 10	< 10	40	-	-	-
513565	RIN01_25/8/16	25/08/2016	Water	-	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.005	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.001	< 0.001	< 0.05	< 0.005	< 0.005	-	-	-
513565	RIN02_26/8/16	26/08/16	Water	-	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.005	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.001	< 0.001	< 0.05	< 0.005	< 0.005	-	-	-
513565	SB01/2_0.6-0.7	25/08/2016	Soil	-	< 2	15	20	60	2000	0.9	< 5	10	< 2	0.4	280	17000	390	-	< 2	8	< 10	< 10	20	-	-	-
514709	SB01/3_1.0-1.1	25/08/2016	Soil	-	18	< 0.4	27	8.9	16	< 0.1	< 5	14	< 2	< 0.2	< 10	23	200	-	< 2	6.6	< 10	< 10	33	-	-	-
513565	SB04/2_0.3-0.4	25/08/2016	Soil	-	< 2	< 0.4	20	15	51	0.1	< 5	9.6	< 2	< 0.2	16	76	-	-	-	-	-	-	-	-	< 5	< 100
513565	SB05/5_2.9-3.0	25/08/2016	Soil	8.9	3.9	0.5	19	6.7	9	< 0.1	< 5	9	< 2	< 0.2	< 10	24	-	-	-	-	-	-	-	< 1	< 5	< 100
513565	SB06/2_0.3-0.4	25/08/2016	Soil	-	< 2	< 0.4	40	24	15	< 0.1	< 5	23	< 2	< 0.2	< 10	54	-	-	-	-	-	-	-	-	< 5	< 100
513565	SB08/2_1.0-1.1	25/08/2016	Soil	-	< 2	< 0.4	25	13	9.7	< 0.1	< 5	12	< 2	< 0.2	< 10	20	300	-	< 2	11	< 10	< 10	34	-	-	-
513565	SB13/2_0.25-0.35	26/08/16	Soil	-	5.9	0.5	13	53	180	0.4	< 5	10	< 2	0.2	70	520	-	-	-	-	-	-	-	-	< 5	< 100
513565	SB15/3_0.3-0.4	26/08/16	Soil	-	14	0.6	83	310	330	0.5	< 5	62	< 2	< 0.2	75	940	-	-	-	-	-	-	-	-	< 5	< 100
514709	SB15/4_0.85-0.95	26/08/16	Soil	-	10	< 0.4	10	10	37	0.2	< 5	6.2	< 2	< 0.2	< 10	58	330	-	< 2	5.1	< 10	< 10	12	-	-	-
9180	QC08_26/8/2016	26/08/16	Soil	-	6	0.4	18	84	230	0.5	<1	10	<2	<1	16	430	370	-	<1	9	8	<7	-	-	-	-
514709	SB02/2	25/08/2016	Soil	-	9.5	< 0.4	16	12	9.3	< 0.1	< 5	9.6	< 2	< 0.2	< 10	25	670	-	< 2	8.1	< 10	< 10	19	-	-	-
514709	SB03/2	25/08/2016	Soil	-	17	< 0.4	21	13	66	0.2	< 5	12	< 2	< 0.2	< 10	200	210	-	< 2	7.5	< 10	< 10	28	-	-	-
514709	SB10/1	25/08/2016	Soil	-	14	< 0.4	12	29	150	0.3	6.4	7.9	< 2	< 0.2	< 10	590	190	-	< 2	< 5	< 10	< 10	11	-	-	-
514217	SB7/3	25/08/2016	Soil	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	46000	-	-	-	-	-	-	-	-

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Active = 1, Inactive = 0		Guideline Concentrations																							
1	NEPM HIL A (Residential)	-	100	20	-	6000	300	40	-	400	200	-	-	7400	3800	-	60	100	4500	-	-	100	-	-
1	NEPM EIL (urban residential areas & public open space) (aged)	-	100	-	-	150	1100	-	-	490	-	-	-	1500	-	-	-	-	-	-	-	-	-	-

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Note that CCME 2010 SQG guidelines are used only where there is no available applicable NEPM EIL
Note that USEPA Eco-SSL guidelines are used only where there is no available applicable NEPM EIL or CCME 2010 SQG
Note that the most conservative environmental criteria from the USEPA Eco-SSL guidelines are adopted

Relative percentage difference (RPD) calculations

Data Reference Number	Sample Number	Date Sampled	Sample Description	pH	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	Manganese	Iron	Beryllium	Cobalt	Boron	Antimony	Vanadium	Chromium (VI)	Cyanide (total)	Fluoride
					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	mg/kg	mg/kg	mg/kg
9180	QC08_26/8/2016	26/08/16	Soil	-	6	0.4	18	84	230	0.5	<1	10	<2	<1	16	430	370	-	<1	9	8	<7	-	-	-	-
513565	SB15/3_0.3-0.4	26/08/16	Soil	-	14	0.6	83	310	330	0.5	< 5	62	< 2	< 0.2	75	940	-	-	-	-	-	-	-	-	< 5	< 100
RPD (%)				-	80	40	129	115	36	0	-	144	-	-	130	74	-	-	-	-	-	-	-	-	-	-
513565	QC04_25/8/16		Soil	-	< 2	< 0.4	35	19	12	< 0.1	< 5	21	< 2	< 0.2	< 10	42	220	-	< 2	9.6	< 10	< 10	40	-	-	-
513565	SB06/2_0.3-0.4		Soil	-	< 2	< 0.4	40	24	15	< 0.1	< 5	23	< 2	< 0.2	< 10	54	-	-	-	-	-	-	-	-	< 5	< 100
RPD (%)				-	-	-	13	23	22	-	-	9	-	-	-	25	-	-	-	-	-	-	-	-	-	-

According to AS4482.1-2005, an According to AS4482.1-2005, an RPD within the range of -50% to 50% is considered to show acceptable agreement

M

MACDONALD

Description				Phenols (Halogenated and Non-Halogenated)																			
Data Reference Number	Sample Number	Date Sampled	Sample Description	2.4.5-Trichlorophenol	2.4.6-Trichlorophenol	2.4-Dichlorophenol	2.6-Dichlorophenol	2-Chlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Tetrachlorophenols - Total	Total Halogenated Phenol*	2.4-Dimethylphenol	2.4-Dinitrophenol	2-Cyclohexyl-4.6-dinitrophenol	2-Methyl-4.6-dinitrophenol	2-Methylphenol (o-Cresol)	3&4-Methylphenol (m&p-Cresol)	4-Nitrophenol	2-Nitrophenol	Dinoseb	Phenol	Total Non-Halogenated Phenol*
				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
513565	SB04/2_0.3-0.4	25/08/2016	Soil	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 1	< 1	< 1	< 0.5	< 5	< 20	< 5	< 0.2	< 0.4	< 5	< 1	< 20	< 0.5	< 20
513565	SB05/5_2.9-3.0	25/08/2016	Soil	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 1	< 1	< 1	< 0.5	< 5	< 20	< 5	< 0.2	< 0.4	< 5	< 1	< 20	< 0.5	< 20
513565	SB06/2_0.3-0.4	25/08/2016	Soil	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 1	< 1	< 1	< 0.5	< 5	< 20	< 5	< 0.2	< 0.4	< 5	< 1	< 20	< 0.5	< 20
513565	SB13/2_0.25-0.35	26/08/2016	Soil	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 1	< 1	< 1	< 0.5	< 5	< 20	< 5	< 0.2	< 0.4	< 5	< 1	< 20	< 0.5	< 20
513565	SB15/3_0.3-0.4	26/08/2016	Soil	< 1	< 1	< 0.5	< 0.5	< 0.5	< 1	< 1	< 1	< 1	< 0.5	< 5	< 20	< 5	< 0.2	< 0.4	< 5	< 1	< 20	< 0.5	< 20
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Active = 1, Inactive = 0				Guideline Concentrations																			
1	NEPM HIL A (Residential)			-	-	-	-	-	-	100	-	-	-	-	-	-	400	-	-	-	3000	-	
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Description				Total Recoverable Hydrocarbons											
Data Reference Number	Sample Number	Date Sampled	Sample Description	TRH C10-36 (Total)	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C6-C9	TRH >C10-C16	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34	TRH >C34-C40	TRH C6-C10	TRH C6-C10 less BTEX (F1)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
513565	SB04/2_0.3-0.4	25/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
513565	SB05/5_2.9-3.0	25/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
513565	SB06/2_0.3-0.4	25/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
513565	SB13/2_0.25-0.35	26/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
513565	SB15/3_0.3-0.4	26/08/2016	Soil	**125**	< 20	**69**	**56**	< 20	< 50	< 50	**100**	< 100	< 20	< 20
514709	SB15/4_0.85-0.95	26/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
514709	SB03/2	25/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
514709	SB08/3	25/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20
514709	SB10/1	25/08/2016	Soil	**110**	< 20	**110**	< 50	< 20	< 50	< 50	**110**	< 100	< 20	< 20
515606	SB10/2_1.1-1.2	25/08/2016	Soil	< 50	< 20	< 50	< 50	< 20	< 50	< 50	< 100	< 100	< 20	< 20

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Active = 1, Inactive = 0	Guideline Concentrations											
1	NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Sand	-	-	-	-	-	-	110	-	-	-	45
1	NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Sand	-	-	-	-	-	-	240	-	-	-	70
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Sand	-	-	-	-	-	-	440	-	-	-	110
1	NEPM HSL A & HSL B (Low-high density residential) (4m+) - Sand	-	-	-	-	-	-	NL	-	-	-	200
1	NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Clay	-	-	-	-	-	-	280	-	-	-	50
1	NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Clay	-	-	-	-	-	-	NL	-	-	-	90
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Clay	-	-	-	-	-	-	NL	-	-	-	150
1	NEPM HSL A & HSL B (Low-high density residential) (4m+) - Clay	-	-	-	-	-	-	NL	-	-	-	290
1	NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Silt	-	-	-	-	-	-	230	-	-	-	40
1	NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Silt	-	-	-	-	-	-	NL	-	-	-	65
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Silt	-	-	-	-	-	-	NL	-	-	-	100
1	NEPM HSL A & HSL B (Low-high density residential) (4m+) - Silt	-	-	-	-	-	-	NL	-	-	-	190
1	NEPM management limits (residential, parkland & public open space - coarse)	-	-	-	-	-	1000	-	2500	10000	700	-
1	NEPM management limits (residential, parkland & public open space - fine)	-	-	-	-	-	1000	-	3500	10000	800	-
1	NEPM ESLs (urban residential & public open space - coarse)	-	-	-	-	-	-	120	300	2800	-	180
1	NEPM ESLs (urban residential & public open space - fine)	-	-	-	-	-	-	120	1300	5600	-	180

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Description				Polychlorinated Biphenyls (PCBs)							
Data Reference Number	Sample Number	Date Sampled	Sample Description	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Total PCB*
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
513565	SB04/2_0.3-0.4	25/08/2016	Soil	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
513565	SB05/5_2.9-3.0	25/08/2016	Soil	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
513565	SB06/2_0.3-0.4	25/08/2016	Soil	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
513565	SB13/2_0.25-0.35	26/08/2016	Soil	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
513565	SB15/3_0.3-0.4	26/08/2016	Soil	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
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Active = 1, Inactive = 0	Guideline Concentrations										
1	NEPM HIL A (Residential)			-	-	-	-	-	-	-	1
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Description				Organochlorine Pesticides (OCP)																								
Data Reference Number	Sample Number	Date Sampled	Sample Description	4,4'-DDD	4,4'-DDE	4,4'-DDT	a-BHC	b-BHC	d-BHC	Chlordanes - Total	Aldrin	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan Sulphate	Endrin	Endrin Aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyrifos	Bifenthrin
				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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
513565	SB04/2_0.3-0.4	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB05/5_2.9-3.0	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB06/2_0.3-0.4	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB10/1_0.1-0.2	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB11/1_0.09-0.2	25/08/2016	Soil	**0.07**	**0.20**	**0.11**	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
514709	SB11/2_0.8-0.9	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB12/1_0.09-0.2	26/08/16	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB13/2_0.25-0.35	26/08/16	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	**0.19**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
514709	SB13/3_0.4-0.5	26/08/16	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB14/1_0.12-0.22	26/08/16	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
513565	SB15/3_0.3-0.4	26/08/16	Soil	< 0.05	**0.15**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
514709	SB15/4_0.85-0.95	26/08/16	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
514709	SB03/2	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
514709	SB07/2	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-
514709	SB08/3	25/08/2016	Soil	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 1	-	-

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Active = 1, Inactive = 0	Guideline Concentrations																											
1	NEPM HIL A (Residential)			240		-	-	-	50		6			270		-	10	-	-	-	6	-	10	300	20	160	600
1	NEPM EIL (urban residential areas & public open space) (aged)	-	-		180	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Description				Polycyclic Aromatic Hydrocarbons (PAH)																				
Data Reference Number	Sample Number	Date Sampled	Sample Description	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (medium bound) *	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzo(b+k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAH*	Carcinogenic PAHs (as BaP TEQ)
				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	mg/kg
513565	SB03/2_0.4-0.5	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
513565	SB04/2_0.3-0.4	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
513565	SB05/5_2.9-3.0	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
513565	SB06/2_0.3-0.4	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
513565	SB13/2_0.25-0.35	26/08/2016	Soil	< 0.5	< 0.5	< 0.5	**0.5**	**0.5**	**0.9**	< 0.5	**0.5**	< 0.5	-	**0.6**	< 0.5	**0.8**	< 0.5	< 0.5	< 0.5	< 0.5	**0.8**	**3.7**	-
514709	SB13/3_0.4-0.5	26/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
513565	SB15/3_0.3-0.4	26/08/2016	Soil	< 0.5	< 0.5	< 0.5	**2**	**2.2**	**3.5**	**1.9**	**1.8**	**2**	-	**1.9**	**0.5**	**2.8**	< 0.5	**1.3**	< 0.5	**1.1**	**2.7**	**20.2**	-
514709	SB15/4_0.85-0.95	26/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
514709	SB03/2	25/08/2016	Soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.5	-	-	-	-	-
514709	SB07/2	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
514709	SB08/3	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
514709	SB10/1	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	**1.6**	**2.5**	**3.5**	**2**	**2**	**1.5**	-	**1.6**	< 0.5	**2.6**	< 0.5	**1.6**	< 0.5	**0.8**	**2.5**	**18.7**	-
514709	SB12/2	26/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
514709	SB14/3	26/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-
515606	SB10/2_1.1-1.2	25/08/2016	Soil	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-

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Active = 1, Inactive = 0	Guideline Concentrations																						
1	**NEPM HIL A (Residential)**	-	-	-	-	-	**3**	-	-	-	-	-	-	-	-	-	-	-	-	-	**300**	**3**
1	**NEPM EIL (urban residential areas & public open space) (aged)**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**170**	-	-	-	-
1	**NEPM ESLs (urban residential & public open space - coarse)**	-	-	-	-	**0.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	**NEPM ESLs (urban residential & public open space - fine)**	-	-	-	-	**0.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Sand**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Sand**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Sand**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (4m+) - Sand**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Clay**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Clay**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Clay**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (4m+) - Clay**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Silt**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Silt**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Silt**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-
1	**NEPM HSL A & HSL B (Low-high density residential) (4m+) - Silt**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**NL**	-	-	-	-

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MOTT MACDONALD

Description				BTEX					
Data Reference Number	Sample Number	Date Sampled	Sample Description	Benzene	Ethylbenzene	m&p-Xylenes	o-Xylene	Toluene	Xylenes - Total
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
513565	SB04/2_0.3-0.4	25/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	SB04/6_5.9-6.0	25/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	SB05/5_2.9-3.0	25/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	SB06/2_0.3-0.4	25/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	SB07/5_5.0-5.1	25/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	SB13/2_0.25-0.35	26/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	SB15/3_0.3-0.4	26/08/2016	Soil	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.3
513565	TRIP01_25/8/16	25/08/2016	Water	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.003

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Active = 1, Inactive = 0	Guideline Concentrations						
1	NEPM ESLs (urban residential & public open space - coarse)	50	70	-	-	85	105
1	NEPM ESLs (urban residential & public open space - fine)	65	125	-	-	105	45
1	NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Sand	0.5	55	-	-	160	40
1	NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Sand	0.5	NL	-	-	220	60
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Sand	0.5	NL	-	-	310	95
1	NEPM HSL A & HSL B (Low-high density residential) (4m+) - Sand	0.5	NL	-	-	540	170
1	NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Clay	0.7	NL	-	-	480	110
1	NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Clay	1	NL	-	-	NL	310
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Clay	2	NL	-	-	NL	NL
1	NEPM HSL A & HSL B (Low-high density residential) (4m+) - Clay	3	NL	-	-	NL	NL
1	NEPM HSL A & HSL B (Low-high density residential) (0m to <1m) - Silt	0.6	NL	-	-	390	95
1	NEPM HSL A & HSL B (Low-high density residential) (1m to <2m) - Silt	0.7	NL	-	-	NL	210
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Silt	1	NL	-	-	NL	NL
1	NEPM HSL A & HSL B (Low-high density residential) (4m+) - Silt	2	NL	-	-	NL	NL

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Description				Acid Herbicides												
Data Reference Number	Sample Number	Date Sampled	Sample Description	2.4.5-T	2.4.5-TP	2.4-D	2.4-DB	Actril (loxynil)	Dicamba	Dichlorprop	Dinitro-o-cresol	Dinoseb	MCPA	MCPB	Mecoprop
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
513565	SB04/2_0.3-0.4	25/08/2016	Soil	-	-	-	-	-	-	-	-	< 20	-	-	-
513565	SB05/5_2.9-3.0	25/08/2016	Soil	-	-	-	-	-	-	-	-	< 20	-	-	-
513565	SB06/2_0.3-0.4	25/08/2016	Soil	-	-	-	-	-	-	-	-	< 20	-	-	-
513565	SB13/2_0.25-0.35	26/08/2016	Soil	-	-	-	-	-	-	-	-	< 20	-	-	-
513565	SB15/3_0.3-0.4	26/08/2016	Soil	-	-	-	-	-	-	-	-	< 20	-	-	-

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Active = 1, Inactive = 0	Guideline Concentrations													
1	NEPM HIL A (Residential)	600	-	900	-	-	-	-	-	-	600	600	600

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| Description | | | | Volatile Organic Compounds (VOCs) | | | |

MOTT MACDONALD

Description				Heavy Metals & pH																				Heavy Metals (filtered)																							
Data Reference Number	Sample Number	Date Sampled	Sample Description	Total dissolved solids	pH	Arsenic	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	Cyanide (total)	Fluoride	Manganese	Vanadium	Boron	Chromium	Cobalt	Beryllium	Arsenic (filtered)	Cadmium (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Molybdenum (filtered)	Nickel (filtered)	Selenium (filtered)	Silver (filtered)	Tin (filtered)	Zinc (filtered)	Manganese (filtered)	Boron (filtered)	Chromium (filtered)	Cobalt (filtered)	Beryllium (filtered)	Antimony (filtered)	Vanadium (filtered)					
						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	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	mg/L	mg/L	mg/L					
9238	DUP2_5/9/16 (2)	5/9/16	Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	0.001	<0.001	<0.00005	0.002	0.004	0.001	<0.001	0.001	0.055	0.2	<0.001	0.006	<0.0005	-	<0.001					
514490	DUP1_5/9/16 (2)	5/9/16	Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.001	< 0.0002	0.002	< 0.001	< 0.0001	< 0.005	0.005	0.002	< 0.005	< 0.005	0.001	0.047	0.2	< 0.001	0.006	< 0.001	< 0.005	< 0.005					
514490	GW1_5/9/16 (2)	5/9/16	Water	1300	7.6	-	-	-	-	-	-	-	-	-	-	-	< 0.005	< 0.5	-	-	-	-	-	-	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.0001	0.025	0.004	0.001	< 0.005	< 0.005	0.001	-	-	< 0.001	-	-	-	-					
514490	GW2_5/9/16 (2)	5/9/16	Water	1500	7.4	-	-	-	-	-	-	-	-	-	-	-	< 0.005	< 0.5	-	-	-	-	-	-	< 0.001	< 0.0002	0.001	< 0.001	< 0.0001	< 0.005	0.004	0.002	< 0.005	< 0.005	0.001	-	-	< 0.001	-	-	-	-					
514490	RIN1_5/9/16 (2)	5/9/16	Water	-	-	< 0.001	< 0.0002	< 0.001	< 0.001	< 0.0001	< 0.005	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	-	-	< 0.005	< 0.005	< 0.05	< 0.001	< 0.001	< 0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
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Active = 1, Inactive = 0	Guideline Concentrations																																														
1	ANZECC (2000) Livestock drinking water trigger value (low risk)	-	-	0.5	0.01	0.4	0.1	0.002	0.15	1	0.02	-	-	20	-	2	-	-	5	1	1	ND	0.5	0.01	0.4	0.1	0.002	0.15	1	0.02	-	-	20	-	5	1	1	ND					
1	ANZECC (2000) Agricultural irrigation water long term use trigger values	-	-	0.1	0.01	0.2	2	0.002	0.01	0.2	0.02	-	-	2	-	1	0.2	0.1	0.5	0.1	0.05	0.1	0.1	0.01	0.2	2	0.002	0.01	0.2	0.02	-	-	2	0.2	0.5	0.1	0.05	0.1					
1	ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)	3000	5.0-9.0	0.05	0.0002	0.005	0.001	0.001	-	0.1	0.01	0.003	0.026	0.005	-	0.02	0.01	0.1	-	0.02	-	-	0.05	0.0002	0.005	0.001	0.001	-	0.1	0.01	0.003	0.026	0.005	0.01	-	0.02	-	-					
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5. Ref to NHMRC - Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) "a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration". This is adopted for inorganic substances, but unless a value is stipulated in the ANZECC (2000) guidance for recreational waters (as is the case for benzene), the drinking water guidelines for other organic compounds (to account for possible dermal contact exposures) are adopted to be conservative.

Relative percentage difference (RPD) calculations																																														
Data Reference Number	Sample Number	Date Sampled	Sample Description	Total dissolved solids	pH	Arsenic	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	Cyanide (total)	Fluoride	Manganese	Vanadium	Boron	Chromium	Cobalt	Beryllium	Arsenic (filtered)	Cadmium (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Molybdenum (filtered)	Nickel (filtered)	Selenium (filtered)	Silver (filtered)	Tin (filtered)	Zinc (filtered)	Manganese (filtered)	Boron (filtered)	Chromium (filtered)	Cobalt (filtered)	Beryllium (filtered)	Antimony (filtered)	Vanadium (filtered)					
						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	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	mg/L	mg/L	mg/L					
514490	DUP1_5/9/16	5/9/16	Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.001	< 0.0002	0.002	< 0.001	< 0.0001	< 0.005	0.005	0.002	< 0.005	< 0.005	0.001	0.047	0.2	< 0.001	0.006	< 0.001	< 0.005	< 0.005					
514490	GW2_5/9/16 (2)	5/9/16	Water	1500	7.4	-	-	-	-	-	-	-	-	-	-	-	< 0.005	< 0.5	-	-	-	-	-	-	< 0.001	< 0.0002	0.001	< 0.001	< 0.0001	< 0.005	0.004	0.002	< 0.005	< 0.005	0.001	-	-	< 0.001	-	-	-	-					
RPD (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-	-	-	22	0	-	-	0	-	-	-	-	-	-	-					
9238	DUP2_5/9/16 (2)	5/9/16	Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.0001	0.001	<0.001	<0.00005	0.002	0.004	0.001	<0.001	<0.001	0.001	0.055	0.2	<0.001	0.006	<0.0005	<0.001	<0.001					
514490	GW2_5/9/16 (2)	5/9/16	Water	1500	7.4	-	-	-	-	-	-	-	-	-	-	-	< 0.005	< 0.5	-	-	-	-	-	-	< 0.001	< 0.0002	0.001	< 0.001	< 0.0001	< 0.005	0.004	0.002	< 0.005	< 0.005	0.001	-	-	< 0.001	-	-	-	-					
RPD (%)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	67	0	-	-	0	-	-	-	-	-	-	-					

According to AS4482.1-2005, an RPD ‹According to AS4482.1-2005, an RPD within the range of -50% to 50% is considered to show acceptable agreement

Description				Phenols (Halogenated and Non-Halogenated)																		
Data Reference Number	Sample Number	Date Sampled	Sample Description	2.4.5-Trichlorophenol	2.4.6-Trichlorophenol	2.4-Dichlorophenol	2.6-Dichlorophenol	2-Chlorophenol	4-Chloro-3-methylphenol	Pentachlorophenol	Tetrachlorophenols - Total	Total Halogenated Phenol	2.4-Dimethylphenol	2.4-Dinitrophenol	2-Cyclohexyl-4.6-dinitrophenol	2-Methyl-4.6-dinitrophenol	2-Methylphenol (o-Cresol)	2-Nitrophenol	3&4-Methylphenol (m&p-Cresol)	4-Nitrophenol	Dinoseb	Phenol	Total Non-Halogenated Phenol
				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	mg/L	mg/L	mg/L	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	< 0.01	< 0.01	< 0.003	< 0.003	< 0.003	< 0.01	< 0.01	< 0.03	< 0.01	< 0.003	< 0.03	< 0.1	< 0.03	< 0.003	< 0.01	< 0.006	< 0.03	< 0.1	< 0.003	< 0.1
514490	GW2_5/9/16 (2)	5/9/16	Water	< 0.01	< 0.01	< 0.003	< 0.003	< 0.003	< 0.01	< 0.01	< 0.03	< 0.01	< 0.003	< 0.03	< 0.1	< 0.03	< 0.003	< 0.01	< 0.006	< 0.03	< 0.1	< 0.003	< 0.1
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Active = 1, Inactive = 0	Guideline Concentrations																						
1	ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)	-	0.002	0.004	0.03	-	-	0.03	-	-	0.4	-	-	-	-	-	-	-	-	0.0006	-	
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5. Ref to NHMRC - Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) “a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration”. This is adopted for inorganic substances, but unless a value is stipulated in the ANZECC (2000) guidance for recreational waters (as is the case for benzene), the drinking water guidelines for other organic compounds (to account for possible dermal contact exposures) are adopted to be conservative.

MOTT MACDONALD

Description				Total Recoverable Hydrocarbons (TRH)											
Data Reference Number	Sample Number	Date Sampled	Sample Description	TRH C10-36 (Total)	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C6-C9	TRH >C10-C16	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34	TRH >C34-C40	TRH C6-C10	TRH C6-C10 less BTEX (F1)
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	< 0.1	< 0.05	< 0.1	< 0.1	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.02	< 0.02
514490	GW2_5/9/16 (2)	5/9/16	Water	< 0.1	< 0.05	< 0.1	< 0.1	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.02	< 0.02
514490	TRIP_5/9/16 (2)	5/9/16	Water	-	-	-	-	-	-	-	-	-	< 0.02	-

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Active = 1, Inactive = 0	Guideline Concentrations											
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Clay	-	-	-	-	-	-	NL	-	-	-	NL
1	NEPM HSL A & HSL B (Low-high density residential) (4m to <8m) - Clay	-	-	-	-	-	-	NL	-	-	-	NL
1	NEPM HSL A & HSL B (Low-high density residential) (8m+) - Clay	-	-	-	-	-	-	NL	-	-	-	NL
0	Dutch 'C' and Intervention Levels (1999 and 2009) recreation and aesthetics	0.6	-	-	-	-	-	-	-	-	-	-
0	WHO Petroleum Products in Drinking Water (2005) health criteria, adjusted for primary contact recreation in accordance with the NHMRC 2008 Guidelines for Managing Risks in Recreational Water	1	1	1	1	1	-	-	-	-	1	-
0	WHO Petroleum Products in Drinking Water (2005) health criteria for drinking water	0.1	0.1	0.1	0.1	0.1	-	-	-	-	0.1	-
1	ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)	0.005	-	-	-	-	-	-	-	-	-	-

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Description				Polychlorinated Biphenyls (PCBs)							
Data Reference Number	Sample Number	Date Sampled	Sample Description	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248	Aroclor-1254	Aroclor-1260	Total PCB
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
514490	GW2_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001

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Active = 1, Inactive = 0	Guideline Concentrations								
1	ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)	-	-	-	-	-	-	-	0.002

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Description				Organochlorine Pesticides (OCPs)																					
Data Reference Number	Sample Number	Date Sampled	Sample Description	4,4'-DDD	4,4'-DDE	4,4'-DDT	a-BHC	b-BHC	d-BHC	g-BHC	Chlordanes - Total	Aldrin	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan Sulphate	Endrin	Endrin Aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Chlorpyrifos
				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	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	< 0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.01	-
514490	GW2_5/9/16 (2)	5/9/16	Water	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	-	< 0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.01	-

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Active = 1, Inactive = 0	Guideline Concentrations																							
1	ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)	0.000015		-	-	-	-	-	0.00001	0.00001	0.000005	0.000003	-	0.000002	-	-	0.000005	-	-	0.00003	0.000002	0.00001
0	Drinking water health guidelines (Guidelines for Managing Risks in Recreational Water, NHMRC 2008)[5]	-	-	0.2	-	-	-	-	0.01	0.003		0.3	-	-	-	-	0.003		-	-	-	0.1

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5. Ref to NHMRC - Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) “a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration”. This is adopted for inorganic substances, but unless a value is stipulated in the ANZECC (2000) guidance for recreational waters (as is the case for benzene), the drinking water guidelines for other organic compounds (to account for possible dermal contact exposures) are adopted to be conservative.

Description				Polycyclic Aromatic Hydrocarbons (PAH)																
Data Reference Number	Sample Number	Date Sampled	Sample Description	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Total PAH
				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	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
514490	GW2_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
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Active = 1, Inactive = 0	**Guideline Concentrations**																			
1	**ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)**	**0.02**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
0	**Drinking water health guidelines (Guidelines for Managing Risks in Recreational Water, NHMRC 2008)[5]**	**-**	**-**	**-**	**-**	**0.0001**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
1	**NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Clay**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**NL**	**-**	**-**	**-**
1	**NEPM HSL A & HSL B (Low-high density residential) (4m to <8m) - Clay**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**NL**	**-**	**-**	**-**
1	**NEPM HSL A & HSL B (Low-high density residential) (8m+) - Clay**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**NL**	**-**	**-**	**-**
INTENTIONALLY LEFT BLANK																				

4. Australian Drinking Water Guidelines, ADWG (2011). Note the most recent ADWGs (2011) indicate there is insufficient data to set drinking water guidelines for PAHs other than benzo(a)pyrene.

5. Ref to NHMRC - Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) "a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration". This is adopted for inorganic substances, but unless a value is stipulated in the ANZECC (2000) guidance for recreational waters (as is the case for benzene), the drinking water guidelines for other organic compounds (to account for possible dermal contact exposures) are adopted to be conservative.

Description				BTEX					
Data Reference Number	Sample Number	Date Sampled	Sample Description	Benzene	Ethylbenzene	m&p-Xylenes	o-Xylene	Toluene	Xylenes - Total
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.003
514490	GW2_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.003
514490	TRIP_5/9/16 (2)	5/9/16	Water	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.003

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Active = 1, Inactive = 0	Guideline Concentrations						
0	Drinking water health guidelines (Guidelines for Managing Risks in Recreational Water, NHMRC 2008)[5]	0.01[1]	3	-	-	8	6
1	ANZECC (2000) Aquaculture and human consumption of aquatic foods (freshwater production)	0.005	-	-	-	0.25	-
1	NEPM HSL A & HSL B (Low-high density residential) (2m to <4m) - Clay	5	NL	-	-	NL	NL
1	NEPM HSL A & HSL B (Low-high density residential) (4m to <8m) - Clay	5	NL	-	-	NL	NL
1	NEPM HSL A & HSL B (Low-high density residential) (8m+) - Clay	5	NL	-	-	NL	NL

INTENTIONALLY LEFT BLANK

1. ANZECC Water Quality Guidelines for Fresh & Marine Waters (ANZECC, 2000)

5. Ref to NHMRC - Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) "a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration". This is adopted for inorganic substances, but unless a value is stipulated in the ANZECC (2000) guidance for recreational waters (as is the case for benzene), the drinking water guidelines for other organic compounds (to account for possible dermal contact exposures) are adopted to be conservative.

Description				Acid Herbicides												
Data Reference Number	Sample Number	Date Sampled	Sample Description	2.4.5-T	2.4.5-TP	2.4-D	2.4-DB	Actril (loxynil)	Dicamba	Dichlorprop	Dinitro-o-cresol	Dinoseb	MCPA	MCPB	Mecoprop
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	-	-	-	-	-	-	-	-	< 0.1	-	-	-
514490	GW2_5/9/16 (2)	5/9/16	Water	-	-	-	-	-	-	-	-	< 0.1	-	-	-
	INTENTIONALLY LEFT BLANK														
Active = 1, Inactive = 0	Guideline Concentrations														
0	Drinking water health guidelines (Guidelines for Managing Risks in Recreational Water, NHMRC 2008)[5]			1	-	0.3	-	-	1	-	-	-	-	-	-
INTENTIONALLY LEFT BLANK															

| Description | | | | Halogenated Volatile Organic Compounds (HVOCs) | | | |

Description				Chlorinated Hydrocarbons																
Data Reference Number	Sample Number	Date Sampled	Sample Description	1.2.3.4-Tetrachlorobenzene	1.2.3.5-Tetrachlorobenzene	1.2.3-Trichlorobenzene	1.2.4.5-Tetrachlorobenzene	1.2.4-Trichlorobenzene	1.2-Dichlorobenzene	1.3.5-Trichlorobenzene	1.3-Dichlorobenzene	1.4-Dichlorobenzene	Benzal chloride	Benzotrichloride	Benzyl chloride	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Pentachlorobenzene
				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	mg/L
514490	GW1_5/9/16 (2)	5/9/16	Water	-	-	-	-	< 0.02	< 0.001	-	< 0.001	< 0.001	-	-	-	< 0.0001	< 0.02	-	-	-
514490	GW2_5/9/16 (2)	5/9/16	Water	-	-	-	-	< 0.02	< 0.001	-	< 0.001	< 0.001	-	-	-	< 0.0001	< 0.02	-	-	-

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Active = 1, Inactive = 0	Guideline Concentrations																		
0	Drinking water health guidelines (Guidelines for Managing Risks in Recreational Water, NHMRC 2008)[5]	-	-	-	-	-	15	-	-	0.4	-	-	-	-	-	-	-	-	-

INTENTIONALLY LEFT BLANK

5. Ref to NHMRC - Guidelines for Managing Risks in Recreational Water (NHMRC, 2008) "a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration". This is adopted for inorganic substances, but unless a value is stipulated in the ANZECC (2000) guidance for recreational waters (as is the case for benzene), the drinking water guidelines for other organic compounds (to account for possible dermal contact exposures) are adopted to be conservative.

I. Honesty in reporting form

Site contamination—honesty in reporting

EPA South Australia

1 Site contamination consultant/auditor contact details *(this section is to be completed by the consultant or auditor)*

Form completed whilst engaged as a consultant [✓] or auditor [ ] *(tick only one box)*

Consultant/auditor company: MOTT MACDONALD AUSTRALIA PTY LTD

Auditor accreditation number (if applicable):

Postal address: MEZZANINE LEVEL, 22 KING WILLIAM ST

ADELAIDE SA 5000

Telephone: ( ) ~~Facsimile: ( )~~ 08 7325 7325

Email: ASHLEY.MOULE@MOTTMAC.COM

Consultant/auditor reference: 371786

EPA reference number (if applicable): N/A

Declaration:

I understand that it is an offence to provide false or misleading information to the Authority (section 120A of the Environment Protection Act 1993).

I understand that I must clearly qualify any statement of my opinion as to the existence of site contamination at the site by specifying the land uses that were taken into account in forming that opinion (section 103ZA of the Environment Protection Act 1993).

Maximum penalties range up to $15,000 for individuals to $60,000 for corporations.

Name: ASHLEY MOULE

Signature:

Position of signatory: PRINCIPAL Date: 23/9/16

2 Site information *(this section is to be completed by the consultant or auditor)*

Site name (if applicable):

Site address: 25 College Rd, Kent Town, SA

Certificate of Title number(s):

CT6130/16

Date(s) of assessment:

23/9/16

Site owner and contact details:

25 CKT Pty Ltd

Site occupier and contact details:

Bureau of Meteorology

Name, address and position of person requesting report:

25 CKT Pty Ltd

Existing or proposed land use:

Residential is proposed

Consultant/auditor reference:

N/A - Auditor. 371786-MM

3 Person(s) providing information to site contamination consultants or auditors *(this section is to be completed by each person who provides information to a consultant or an auditor)*

Section 103ZB of the Environment Protection Act 1993 states that:

> A person must not make a statement that the person knows to be false or misleading in a material particular (whether by reason of the inclusion or omission of any particular) in any information furnished to a site contamination auditor or site contamination consultant that might be relied on by the auditor or consultant in preparing a report relating to site contamination (whether or not required under this or any other Act).

Maximum penalties range from $30,000 for individuals to $60,000 for corporations.

Declaration:

I hereby declare I have read and that I understand section 103ZB of the Environment Protection Act 1993 printed above.

Name: ASHLEY MOULE

Signature:

Position of signatory: PRINCIPAL Date: 23/9/16

Name:

Signature:

Position of signatory: Date:

Name:

Signature:

Position of signatory: Date:

Name:

Signature:

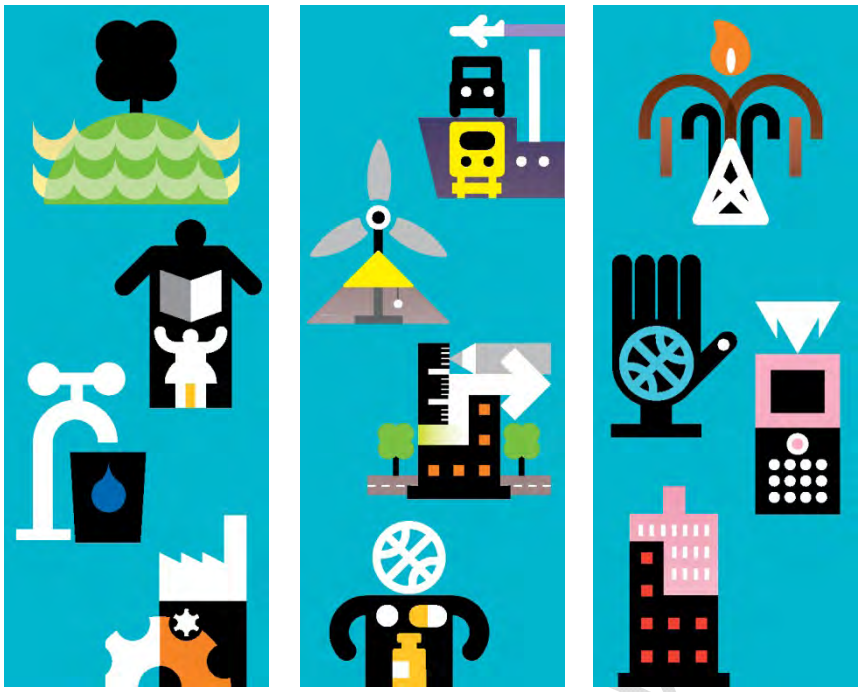
Position of signatory: Date:

Name:

Signature:

Position of signatory: Date:

J. Previous site history assessment report



Preliminary Environmental Site History Assessment

Draft for client review

25 College Road, Kent Town, South Australia

29 April 2016

The Trustee for Scope Development Trust

Preliminary Environmental Site History Assessment

25 College Road, Kent Town, South Australia

29 April 2016

The Trustee for Scope Development Trust

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Mott MacDonald

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	28 April 2016	RL/CK	AM	AM	Draft for client review
B	29 April 2016	RL/CK	AM	AM	Draft for client review (proposal details added)

Secure

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Contents

Chapter Title		Page
1	Introduction	1
1.1	Background	1
1.2	Proposed Development	2
1.3	Aim	2
1.4	Scope of work	2
2	Regulatory and assessment framework	4
2.1	Site contamination	4
2.2	Norwood Payneham and St Peters (City) Development Plan(Consolidated – 2 July 2015)	4
2.3	Environment Protection Act, 1993	5
2.4	Assessment guidelines	6
3	Site description	7
3.1	Site walkover and photographs	7
3.2	Aesthetic considerations	10
3.3	Surrounding land use	10
3.4	Regional geology and hydrogeology	11
3.5	History of ownership	11
3.6	Almanacs and directories research	14
3.7	Aerial photographs	15
3.8	Dangerous goods search	15
3.9	EPA Section 7 search	15
3.10	SA EPA Public Register Directory	15
3.11	Asbestos register	16
3.12	Acid sulphate soils	16
3.13	Areas of environmental interest	16
4	Conclusion	17
4.1	Findings	17
4.2	Preliminary risk appraisal	17
4.3	Commercial context	18
4.4	Recommendations	18
5	Limitations	19

Appendices 21

Appendix A. Certificate of title 22
Appendix B. DEWNR groundwater data 23
Appendix C. Historical aerial photographs 24
Appendix D. Dangerous goods licence search results 25
Appendix E. Section 7 search results 26
Appendix F. State Library of South Australia almanac and directory search results 27

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Appendix G. Asbestos register 28

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1 Introduction

1.1 Background

Mott MacDonald Australia Pty Ltd (Mott MacDonald) was commissioned by The Trustee for Scope Development Trust to conduct environmental site history research for the land defined as 25 College Road, Kent Town, South Australia (CT 6130/16). A copy of the applicable Certificate of Title is provided in Appendix A.

The site is situated in the City of Norwood Payneham and St Peters local government area. The site context is provided in Figure 1.1, and an aerial photograph showing the site is provided in Figure 1.2.

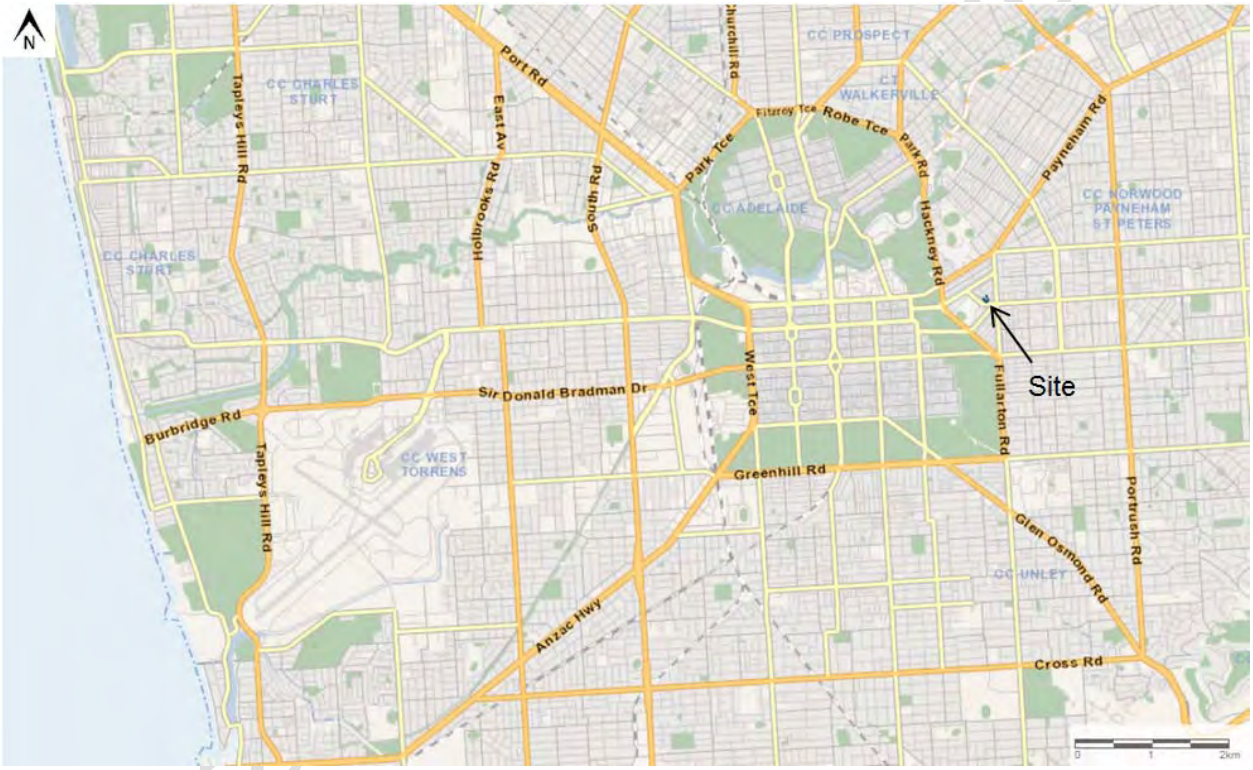


Figure 1.1: Map showing site location and context (source: http://maps.sa.gov.au/plb/, 2016)

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Figure 1.2: Aerial photograph showing the approximate site boundary (source: http://maps.sa.gov.au/plb/, 2016)

1.2 Proposed Development

We understand the nature of the proposed development to be elevated multi-storey residential apartments. The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark. Groundwater is not proposed for abstraction at the site and there would be little opportunity for access to subsurface soils once developed. The site would not be used for primary food production.

1.3 Aim

The aim was to assess the potential for gross or widespread soil contamination to exist as a result of current or previous land uses at the site and whether there are issues likely to present potential liabilities or constraints on future development.

1.4 Scope of work

The site history assessment included consideration of information from the following sources:

- Site walkover
- Safework SA Dangerous Goods Licence Search [results are pending]
- Environment Protection Authority (EPA) Section 7 Search
- Department of Planning, Transport and Infrastructure (DPTI) Property Assist Certificate of Title search

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- Department of Environment, Water and Natural Resources (DEWNR) Mapland historical aerial photograph search
- Department of Environment, Water and Natural Resources Groundwater Database search
- Historical certificate of title search via the Department of Planning, Transport and Infrastructure South Australian Integrated Land Information System (SALIS)
- State Library of South Australia almanacs and directories research
- Appendix A of the SA EPA Guidelines Site Contamination – Acid Sulfate Soil Materials (November 2007)

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2 Regulatory and assessment framework

2.1 Site contamination

Soil contamination has the potential to impact adversely on human health and the environment; however in order for a significant or identifiable risk to be present, there must be an exposure pathway. The exposure pathway comprises the following:

- Source – The presence of a substance that may cause harm.
- Receptor – The presence of a receptor which might be harmed at an exposure point.
- Pathway – The existence of a means or mechanism of exposing a receptor to the source.

In the absence of a plausible exposure pathway there can be minimal risk. Therefore, the presence of 'something measureable' i.e. concentrations of a chemical or presence of asbestos does not necessarily imply that there is measurable human harm. It is necessary to have a significant source of contamination, an appropriate or effective pathway for this to be presented to a receptor, and the receptor must have a negative response to this exposure.

Hence, the nature and importance of sources, receptors and exposure routes will vary with every site, situation, intended end use and environmental setting.

It should also be noted that management measures to address any aspect of the above can reduce the significance of any risks.

2.2 Norwood Payneham and St Peters (City) Development Plan(Consolidated – 2 July 2015)

The Norwood Payneham and St Peters (City) Development Plan (Consolidated – 2 July 2015) contains the following provisions in relation to contaminated sites:

Objectives:

Objective 52: Appropriate assessment and remediation of site contamination to ensure land is suitable from the proposed use and provides a safe and healthy living and working environment.

Objective 53: Protection of human health and the environment wherever site contamination has been identified or suspected to have occurred.

Site Contamination:

172 Development, including land division, should not take place where site contamination has occurred unless the site has been assessed and remediated as necessary to ensure that it is suitable and safe for the proposed use.

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2.3 Environment Protection Act, 1993

In South Australia, the assessment, management and remediation of site contamination is regulated by the *Environment Protection Act 1993* (EP Act). The EP Act defines site contamination in section 5B as follows:

> *(1) For the purposes of this Act, site contamination exists at a site if—*
>
> > *(a) chemical substances are present on or below the surface of the site in concentrations above the background concentrations (if any); and*
> >
> > *(b) the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere; and*
> >
> > *(c) the presence of the chemical substances in those concentrations has resulted in—*
> >
> > > *(i) actual or potential harm to the health or safety of human beings that is not trivial, taking into account current or proposed land uses; or*
> > >
> > > *(ii) actual or potential harm to water that is not trivial; or*
> > >
> > > *(iii) other actual or potential environmental harm that is not trivial, taking into account current or proposed land uses.*
>
> *(2) For the purposes of this Act, environmental harm is caused by the presence of chemical substances—*
>
> > *(a) whether the harm is a direct or indirect result of the presence of the chemical substances; and*
> >
> > *(b) whether the harm results from the presence of the chemical substances alone or the combined effects of the presence of the chemical substances and other factors.*
>
> *(3) For the purposes of this Act, site contamination does not exist at a site if circumstances of a kind prescribed by regulation apply to the site.*

Based on the above, the first stage in determining whether or not site contamination exists is to assess whether chemical substances have been added to the site through an activity and whether these substances are above background concentrations. The second stage is to assess whether the chemical substances have resulted in actual or potential harm to the health or safety of human beings or the environment that is not trivial.

The professional assessment of site contamination and consequential risk to human health and the environment is guided by the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM), Australian Standards and several guidelines prepared the EPA. The NEPM operates as an environment protection policy under the EP Act.

If site contamination is determined to be present at a site, the EP Act provides mechanisms to assign responsibility for the contamination and appropriate assessment and/or remediation of the contamination.

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2.4 Assessment guidelines

The scope of works and methodology adopted for the site history research were generally based on the guidance provided in the following documents:

- ANZECC/NHMR.C (1992). Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites.
- NEPC (1999), National Environment Protection (Assessment of Site Contamination) Measure, December 1999 (ASC NEPM) as amended in 2013
- Edwards J.W., Van Alphen M. and Langley A. (1994). Identification and Assessment of Contaminated Land: Improving Site History Appraisal. Contaminated Sites Monograph Series No 3, SA Health Commission, Adelaide.
- Standards Australia. Guide to the investigation and sampling of sites with potentially contaminated soil – AS 4482.1-2005.

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3 Site description

3.1 Site walkover and photographs

A site visit was conducted on 27 April 2016 by a Mott MacDonald representative. The site is approximately 3,370m^2 in plan area. Access to the site building is from street level off College Road. However, the ground level of the site is approximately 2.5m below street/ground level. It would appear that the site has been cut away in the past and retaining walls front College Road and the site to the south.

The site is occupied by a large multi-storey building across approximately two thirds of the site. A bitumen carpark is located in the north-western portion of the site. A loading bay is located in the southern portion and a garden is located in the northern portion.

Site walkover photographs are shown in Photos 3.1-3.10.

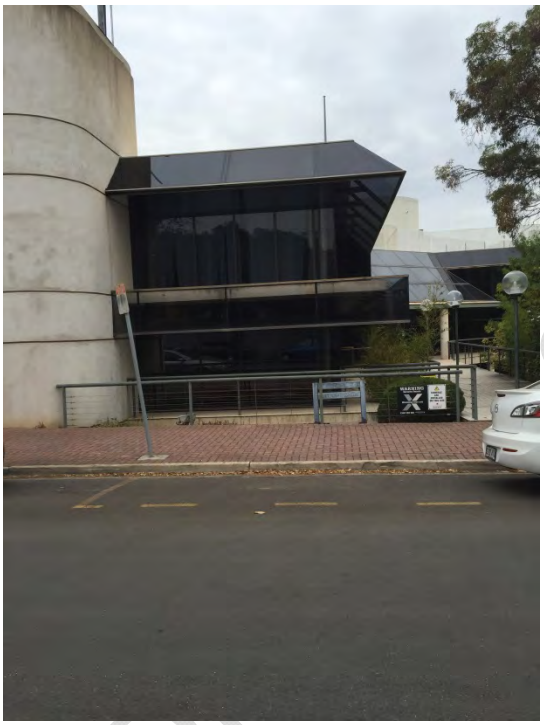


Photo 3.1: Photograph of outside of site taken from College Road looking west



Photo 3.2: Photograph of rear of site showing southern portion of site

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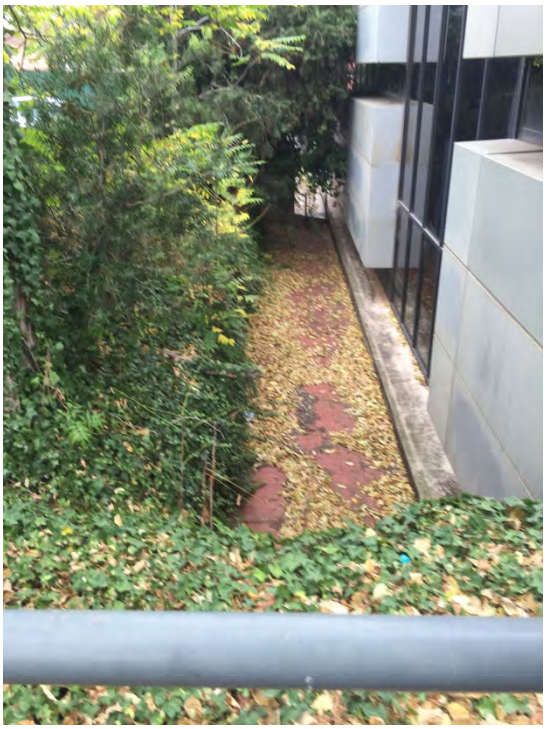


Photo 3.3: Photograph of southern boundary of site



Photo 3.4: Photograph of southern face of site building



Photo 3.5: Photograph of central ground level site courtyard

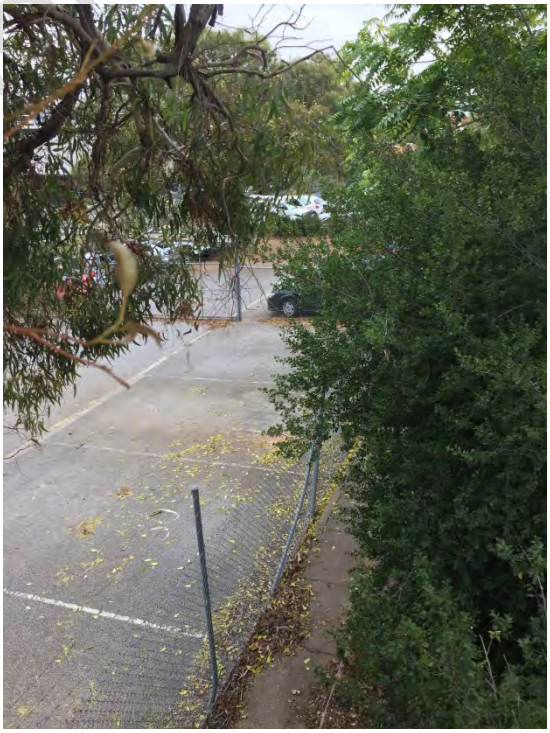


Photo 3.6: Photograph of site carpark facing west

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Photo 3.7: Photograph of inside of site building



Photo 3.8: Photograph of inside of site building



Photo 3.9: Photograph of inside of site building



Photo 3.10: Photograph of inside of site building

3.2 Aesthetic considerations

Aesthetic considerations relate to the presence of low-concern or non-hazardous inert foreign material (refuse) in soil or fill resulting from human activity. Construction and demolition waste materials, some of which are inert and non-hazardous and are widely distributed in urban areas, soils with discolouration from relatively inert chemical waste (for example ferric metals) or residual odour (for example, natural sulphur odour) are included in this category.

There are no specific numeric aesthetic guidelines; however site assessment requires balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity. The following observations were made in relation to aesthetic issues at the site:

- There were no significant odours (e.g. strong residual petroleum hydrocarbon odours)
- There was no hydrocarbon sheen on the site surface
- There were no discoloured chemical deposits or stains with chemical waste.
- There were no observations of large monolithic deposits of otherwise low-risk material, e.g. gypsum as powder or plasterboard/cement kiln dust
- There was no putrescible refuse, including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste

3.3 Surrounding land use

The site is located on the southern side of College Road, and is set approximately 100m back from the Fullarton Road and The Parade intersection in the south-eastern corner of the suburb of Kent Town. The site is currently occupied by the Australia Bureau of Meteorology (BOM). The surrounding area contains a mixture of residential properties (generally to the north-east) and commercial properties (to the west and south). Specifically:

- A commercial property (financial services) and associated car park is located directly to the south-east of the site.
- Chloe's Restaurant and Function Centre are located directly opposite the site at 36 College Road.
- Opposite the site along College Road to the north-west are residential houses and unit blocks (medium to high density housing).
- The rear of the site fronts onto Little Young Street. Little Young Street is lined with commercial properties and associated car parking, beyond which are the Prince Alfred College grounds.
- A metal working/blacksmith operation is located on the south-western boundary of the site.

The surrounding area is generally level.

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3.4 Regional geology and hydrogeology

A summary of the regional geology and hydrogeology is presented in Table 3.1.

Table 3.1: Regional geology and hydrogeology

Source	Detail
Soil	
South Australia 1: 250 000 Scanned Geological Maps Published and Unpublished. Department for Manufacturing, Innovation, Trade, Resources and Energy. Version 2008:2.	Pooraka Formation. Pale red-brown sandy clay containing carbonate of the LOVEDAY SOIL. Gravel lenses near ranges. Small outcrops of older calcrete and veneers of younger sand and soil are not differentiated.
Hydrogeology	
Department of Environment, Water and Natural Resources Groundwater Database (refer to Appendix B)	The DEWNR groundwater database indicates that there are 26 groundwater wells within a 0.5km radius of the site. The recorded standing water levels in the area surrounding the site vary between 3.6-9.25mbgl. The maximum recorded depth of the wells ranges from 6.2-94.4mbgl. Total dissolved solid concentrations are recorded as being between 350mg/L and 1,885mg/L. The wells are listed as being for the following purposes: ▪ Investigation (11) ▪ TWS (2) ▪ Monitoring (1) ▪ Observation (1) ▪ Domestic (1) No groundwater wells are recorded as occurring at the site. The groundwater data report and plan showing the location of groundwater wells surrounding the site are provided in Appendix B.

The closest major surface waterbody to the site is the River Torrens, located approximately 1.5km north-west of the site. Three ponds in the city parklands are located approximately 875m west of the site. The Gulf St Vincent is located approximately 11.5km west of the site.

3.5 History of ownership

A history of ownership search was conducted through the DPTI South Australian Integrated Land Information System (SALIS) website[1] for CT 6130/16. The search results are summarised in Table 3.2.

Table 3.2: Ownership summary

Title reference	Date	Name	Details
CT6130/16	5/2/2014	Famus Pty Ltd	West Perth
CT5526/586	21/4/1998	Famus Pty Ltd	West Perth
	1/10/2007	7 year lease to Commonwealth of Australia	-
CT5078/934	10/7/1992	The Commonwealth of Australia	Adelaide
CT3543/121	6/2/1968	**Rigby Ltd**	James Place, Adelaide
	20/2/1974	Transfer to Commonwealth of Australia	-
CT1185/144	5/1/1921	William Sanders, Pianoforte Dealer	Adelaide
	24/5/1944	Transfer to Brenda Margaret Bishop, Married woman	Beulah Park
	13/1/1954	Transfer to Otto Emil Benz and Leslie Albert Benz, **Motor Wreckers**	Torrensville
	30/1/1957	Transfer to William Roy Fox, Contractor	Evandale

[1] https://www.sailis.sa.gov.au/home/public

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Title reference	Date	Name	Details
	22/4/1959	Transfer to Ivy May Fox, Home Duties	Kensington
	26/8/1960	Transfer to Phoebe Gladys Martin Rushton Smith, Married Woman	Kent Town
	26/8/1960	Transfer to United Dominions Corporation Australia Ltd	-
	17/7/1967	Transfer to **Rigby Ltd**	James Place, Adelaide
CT2195/138	18/3/1952	Murray Harrison Richardson, Earthmover and Desmond Haig Richardson, Engineer	Richmond, Vic, and Hawthorne
	11/3/1952	Transfer to Claude Hubert Pearce, **Carpenter**	Kent Town
	25/10/1957	Transfer to **Rigby Ltd**	James Place, Adelaide
CT1201/150	8/6/1921	Harriett Alareda Harris, Wife of Charles Davenport Harris, Civil Servant	Hyde Park
	16/5/1934	Transfer to Joseph Bower Rowley, Out of Business	Hyde Park
	1/12/1938	Transfer to Harrison Richardson, Out of Business	Parkside
	28/11/1951	Transfer to Murray Harrison Richardson, **Earth Moving Equipment Operator** and Desmond Haig Richardson, University Student	Richmond, Vic, and Mount Gambier(?)
CT231/131	2/8/1876	Edward William Kitchin, Gentleman	Kent Town
	26/4/1882	Transfer to David Davies, Gentleman	Kent Town
	22/5/1891	Harriett Alareda Harris, Wife of Charles Davenport Harris, Civil Servant; Sidney Eastwood Davies, Merchants Clerk; and James Richard Percival, Storekeeper – Executors of The Will of David Davies	Hyde Park, Broken Hill and [illegible]
	12/11/1894	Transfer to Henry Scott and Walter Gooch, Accountant	Adelaide
	12/8/1907	Transfer to Walter Gooch; Walter Charles Scott, Merchant; and Harry Bentham Field, Bank Manager	Adelaide and Port Adelaide
	31/7/1918	Transfer to Walter Gooch, Merchant; Walter Charles Scott, Out of Business; and Alfred Horsley Chapman, Company Manager	Adelaide and Grange
CT2391/133	3/6/1955	John Henry Swan and Charles Alexander Swan, Real Estate Agents	Glenelg
	24/5/1955	Transfer to Fred Warhurst, **Master Printer**	Currie St, Adelaide
	9/5/1963	Transfer to Phoebe Gladys Martin Rushton Smith, Hospital Proprietress	Kent Town
	17/7/1967	**Rigby Ltd**	James Place, Adelaide
CT281/215	3/7/1878	James Crabb Verco, Gentleman	North Adelaide
	15/12/1885	Transfer to Jane Burges, wife of John Burges, Modeller	Kent Town
	24/10/1889	Transmittal of Mortgage to Tomas Benjamin Verco, Agent	Adelaide
	7/6/1910	Transfer to Richard William Swan, Licenced Land Broker	Adelaide
	10/2/1943	Transmission to John Henry Swan and Charles Alexander Swan, Real Estate Agents	Kingswood and Glenelg
CT3333/168	9/7/1965	Vassiolios Carapanayotis, Labourer and Marigo Carapanayotis, his Wife	Kent Town
	16/11/1966	Transfer to Town and Country Investments Pty Ltd 1/3rd, and Thomas Kalliontzis, Fruit Merchant 2/3rd	Adelaide and Croydon
CT1185/145	5/1/1921	Mary McDonough and Katie McDonough, Spinsters	Kent Town
	16/9/1921	Transfer to Ellen Middleton, Widow	Stirling West
	1/2/1927 [illegible]	Transfer to David Johnston, Caretaker of an estate in fee simple	Norwood
	29/11/1949	Transfer to Elsie May Johnston, Wife	Kent Town
	19/12/1951	Transfer to Elsie May Johnston, Widow and Dorothy Mary	Kent Town

Title reference	Date	Name	Details
		Willshire, Married Woman	
	12/2/1952	Elsie May Johnston married Percy James Schook [illegible], Driver	Hindmarsh
	20/2/1952	Transfer to Dorothy Mary Willshire	
	13/4/1953	Transfer to Torello Cecchezini, Labourer and his Wife, and Amedeo Marzari, Labourer	Kent Town
	29/7/1953	Transfer to Ferdinando Coppola, Labourer and his Wife	Lockleys
	18/8/1953	Transfer to Guiseppe Largi, Labourer	Kent Town
	[Illegible]	Transfer to Vassilios Carapanatyotios, Labourer and his Wife	Kent Town
CT60/65	15/12/1864	John Stagg, Carter [illegible]	Kent Town
	28/3/1882	Transfer to David Davies, Gentleman	Kent Town
	19/1/1887	Transfer to Thomas Edward Acraman, Estate Agent	Adelaide
	30/10/1889	Transfer to George Philip Doolette, Outfitter	Adelaide
	8/3/1892	Transfer to Harriett Alareda Harris, Wife of Charles David Harris Civil Servant; Lucy Goodland, Wife of Harry Philimore Goodland, Civil Servant; and Alice Mary Sims, Widow	Hyde Park, Adelaide and Kew, Vic
	17/6/1914	Transfer to James Thomas Brown, Contractor	Adelaide
	3/7/1920	Transfer to Joseph Christopher Gapp, [illegible]	Adelaide
	19/10/1920	Transfer to Mary Mcdonough and Katie Mcdonough, Spinsters	Kent Town
	12/11/1920	Transfer to William Sauders (no occupation stated)	
CT3508/92	17/8/1967	**Rigby Ltd**	James Place, Adelaide
CT2228/130	26/9/1952	Phoebe Gladys Martin Rushton Smith, Married Woman	Kent Town
	17/7/1967	Transfer to Rigby Ltd	James Place, Adelaide
CT1201/129	4/6/1921	Harriett Alareda Harris, Wife of Charles David Harris Civil Servant; Lucy Goodland, Wife of Harry Philimore Goodland, Civil Servant; and Alice Mary Sims, Widow	Hyde Park, Adelaide and Kew, Vic
	9/4/1921	Transfer to Eugenie Gertrude Harris, Spinster	Kent Town
	31/3/1926	Eugenie Edward Harris married Reginald George Bonython, **Farmer**	Korrika
	5/9/1934	Transmission to Hilary Goodland, Saleswoman	Gardenvale, Vic
	23/10/1934	Transfer to George Smith, **Grazier**	Prospect
	11/12/1942	Transfer to Robert Girling, Out of Business	Dubbo, NSW
	9/3/1945	Transfer to Phoebe Gladys Martin Rushton Smith, Married Woman	Maryborough, Qld
CT1925/54	29/1/1947	Phoebe Gladys Martin Rushton Smith, Married Woman	Maryborough, Qld
	17/7/1967	Transfer to Rigby Ltd	James Place, Adelaide
CT238/128	3/11/1876	Thomas David Pearson, Commission Merchant	Adelaide
	28/4/1879	Transfer to David Davies, Draper	Adelaide
	19/1/1887	Transfer to Thomas Edward Acraman, Estate Agent	Adelaide
	30/10/1889	Transfer to George Philip Doolette, Outfitter	Adelaide
	8/3/1892	Transfer to Harriett Alareda Harris, Wife of Charles David Harris Civil Servant; Lucy Goodland, Wife of Harry Philimore Goodland, Civil Servant; and Alice Mary Sims, Widow	Hyde Park, Adelaide and Kew, Vic
	9/4/1921	Transfer of 1/3rd to Eugenie Gertrude Harris	
	26/10/1927	Eugenie Gertrude Harris married Reginald George	Korrika

Title reference	Date	Name	Details
		Bonython, **Farmer**	
	2/8/1930	Transmission 1/3rd to Hilary Goodland, Saleswoman	Gardenvale, Vic
	23/10/1934	Transfer to George Smith, **Grazier**	Prospect
	11/12/1942	Transfer to Robert Girling, Out of Business	Dubbo, NSW
	9/3/1945	Transfer to Phoebe Gladys Martin Rushton Smith, Married Woman	Maryborough, Qld

Source: Lands Title Office, Department of Planning, Transport and Infrastructure, Government of South Australia

A Google search suggests that Rigby Ltd was a large South Australian publishing house.

3.6 Almanacs and directories research

A search of publically available almanacs and directories via the State Library of South Australia was conducted for the site[2].

The first South Australian directory was published by Robert Thomas of the *South Australian Register* newspaper in 1839. The last directory was published by the Melbourne-based stationers, Sands and McDougall in 1973. The directories included mercantile, ecclesiastical, legal, and other occupational and trade listings. This eventually developed into a 'trades and professions' section. In 1873, Josiah Boothby introduced a street by street listing for the city at the front of the directory. He compiled a list of businesses and private dwellings by location, which continued being published in all subsequent directories until 1973 by Sands and McDougall.

It is noted that street numbers in the city have been changed on occasion, in particular in the mid-1880s when the pattern of odd and even numbering was standardised, and again in 1920 to incorporate the subdivisions of city acres which had taken place since settlement. This therefore makes site identification impossible in some instances and/or misleading. It is also noted that inclusion of business details within the almanacs was not mandatory and therefore the absence of a site address is these directories does not necessarily mean that a business was not present at the site.

The site was searched for in the directories for each year from 1864 to 1973 inclusively. No notable records that apply with reasonable confidence to the site are noted. The applicable extracts are presented in Appendix F.

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[2] Available at: http://guides.slsa.sa.gov.au/

3.7 Aerial photographs

Selected aerial photographs of the area were assessed at approximately 10 year intervals from 1949. The aerial photograph data and observations are presented in Table 3.3 and copies of the photographs are provided in Appendix C.

Table 3.3: Historical aerial photograph review

Year	Notes
1949	The aerial photograph is presented in black and white and is of poor resolution. The site appears to contain two large buildings. The surrounding area is relatively densely built upon. It is not possible to determine the nature of the buildings due to the image quality.
1959	The aerial photograph is presented in black and white and is of poor resolution. The site appears to contain vegetation and some structures, although their nature cannot be determined. The surrounding area appears to be relatively densely built upon. It is not possible to determine the nature of the buildings due to the image quality.
1968	The aerial photograph is presented in black and white and is of low resolution. The site now appears to be cleared with no vegetation or building structures evident. The surrounding area appears to be densely built upon, with a number of large industrial/warehouse looking structures. It is not possible to determine the nature of the buildings due to the image quality.
1979	The aerial photograph is presented in colour and is a very poor resolution. The site appears to contain a single large building structure. The surrounding area appears to be similar to the previous aerial photograph.
1989	The aerial photograph is presented in colour and is of good resolution. The site appears to contain a single large structure on the south-eastern portion, with a car parking area on the north-west and large trees on the north-eastern portion. The surrounding area appears to be similar to the previous aerial photograph.
1999	The aerial photograph is presented in colour. The site appears similar to the previous aerial photograph. The surrounding area appears to be similar to the previous aerial photograph.
2005	The aerial photograph is presented in colour and is of good resolution. The site appears similar to the previous aerial photograph. The surrounding area appears to be similar to the previous aerial photograph.

3.8 Dangerous goods search

[Information pending]

3.9 EPA Section 7 search

A Section 7 search was made under the *Land and Business (Sales and Conveyancing) Act 1994*. The information indicates that no current environmental Performance Agreements, Environment Protection Orders or Clean-up Orders are registered on the site. No known wastes are listed or have been produced on the site. A copy of the Section 7 information is included in Appendix E.

3.10 SA EPA Public Register Directory

The SA EPA Public Register Directory – Site contamination index was searched. This index lists notifications and reports received by the EPA since 1 July 2009 under the *Environment Protection Act 1993*, including S83A notification, Audit notification, Audit termination and Audit reports. No listings in Kent Town or adjacent Norwood were located at or within approximately 350m of the site. The nearest listing was at an approximately 400m distance from the site at 41 Fisher Street and related to fill or soil importation.

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3.11 Asbestos register

An asbestos register has been prepared for the site by Carters Asbestos Management (dated 12 December 2012) and is provided in Appendix G.

3.12 Acid sulphate soils

There was no evidence of the field indicators used to identify acid sulphate soils as listed in Appendix A of the SA EPA Guidelines Site Contamination – Acid Sulphate Soil Materials (2007).

3.13 Areas of environmental interest

Based on this environmental site history research, the chemicals presented in Table 3.4 are indicative of the potential historical and current land uses of CT 6130/16.

The chemicals listed in Table 3.4 are based on AS 4482.1-2005 Appendix J 'Chemical Contaminants Listed by Industry Type', Planning Advisory Notice 20 (PAN 20) Appendix 1 'Examples of potentially contaminating activities and industries' and the Environment Protection Regulations 2009 (EP Regs).

Table 3.4: Summary of potential areas and chemicals of interest

Activity of interest	Chemicals of environmental interest	Medium of interest	Potential significance
Potential fill of unknown origin	Broad analyte screen	Shallow soil	Low
Potential termite treatment	Pesticides, heavy metals	Shallow soil	Low
Motor Wreckers, Earth Moving Equipment Operator	BTEX, PAH, heavy metals, TRH	Soil	Low
Carpenter	Heavy metals from paints, solvents	Soil	Low
Publishing house/Printer	Heavy metals including chromium, solvents, BTEX, PAH, TRH	Soil & groundwater	Medium
Asbestos containing material	Asbestos	Shallow soil	Low if appropriately managed by a qualified asbestos contractor

These chemicals of environmental interest are not a prescriptive list for any further exploratory intrusive assessment that may be conducted, nor a statement of the presence of these chemicals, but rather a list to be given consideration. Analytes to be tested for if further assessment is conducted should be selected based on site specific observations and conditions. In addition, screening level testing may be conducted for analytes which are considered to represent the generally accepted basic suite of chemicals which may then give rise to the need for more detailed or varied analysis.

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4 Conclusion

4.1 Findings

The history of the site has included land uses which have the potential for contaminating activities which may have resulted in the potential for soil and/or groundwater contamination to be present at the site.

The information provided indicates that the site was formerly potentially occupied by other businesses, including a publishing house prior to the construction of the current BOM building.

The aerial photographs available within the allotted report timeframe are of poor quality for the years of 1949 and 1959, therefore it is difficult to discern site features from these images. (Note that higher resolution images are able to be sourced for future reference if required).

The key land use of interest is the occupation by a former publishing and printing house (Rigby Limited). The potential for contamination to have occurred is considered to increase in likelihood further back in time, as waste management practices may have been less developed.

Also of interest are the site levels with respect to the surrounding land and the appearance that the site has been cut down approximately 2.5m fronting College Road and the adjacent property on the southern boundary. Access to the site via Little Young Street is consistent with surrounding ground level, indicating that the site has been potentially cut away. If there have been site works which removed a large proportion of residual soils prior to construction of the BOM building, there is some chance that some residual contamination (if present) from previous land use may well have been removed, however this cannot be verified at this stage.

4.2 Preliminary risk appraisal

We understand the nature of the proposed development to be elevated multi-storey residential apartments. The ground floor level would be dedicated to open car parking space and residential apartments would commence above the carpark. Groundwater is not proposed for abstraction at the site and there would be little opportunity for access to subsurface soils once developed. The site would not be used for primary food production.

This type of development is considered to present a lower risk in terms of the nature of the proposed land use and limited exposure to groundwater and subsurface soils. In addition, the open nature of the ground floor car parking would further reduce the potential impact (if at all present) of any unknown subsurface soil vapour.

Therefore, considering the nature of the previous site works that may have removed a large portion of soils form the site (and therefore potentially a proportion of contaminated soil if present) and the proposed open ground level carpark, it is considered reasonable to assume that the actual likelihood of the site being precluded from the proposed use is low.

In the absence of confirmation of impacts (or otherwise), there is uncertainty regarding the potential future liabilities associated with the soil and groundwater at the site.

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4.3 Commercial context

If contamination is present in the soil and/or groundwater, there may be on-going liabilities associated with the site which may impact (cost and time) on potential future development works. On this basis, the ability to ascertain potential land values and marketing potential is limited without additional understanding as to whether there are potential environmental liabilities associated with the previous land use.

Financial institutions may require further information in relation to potential environmental liabilities. In addition, Council and the SA EPA may also require assurance that the site is suitable for future development in the form a Site Contamination Audit Report from a third party Environmental Auditor (site Contamination). However, this may not be a mandatory requirement given the risk appraisal above. If liabilities are present, they need not necessarily prevent future development (subject to the nature of the contamination) and any potential remedial or monitoring works can be factored into future site development planning.

A greater degree of information in terms of soil and groundwater conditions enables greater certainty to be applied to future land transactions.

4.4 Recommendations

In order to confirm the environmental conditions at the site and the preliminary risk appraisal, we recommend that an intrusive soil and groundwater (if required based on soil assessment results) assessment be conducted.

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5 Limitations

Mott MacDonald Australia Pty Ltd (Mott MacDonald) has prepared this report based on generally accepted practices and standards in operation at the time that it was prepared. No other warranty is made as to the professional advice included in this report. All parties should satisfy themselves that the scope of work conducted and reported herein meets their specific needs before relying on this document.

Mott MacDonald believes that its opinions have been developed according to the professional standard of care for the environmental consulting profession at the date of this document. That standard of care may change as new methods and practices of exploration, testing, analysis and remediation develop in the future, which may produce different results.

Environmental conditions are created by natural processes and human activity, and as such may change over time e.g. groundwater levels may rise or fall, contamination may migrate and fill may be added to the site. This report therefore presents a point in time assessment of the site, and as such can only be valid for the time at which the investigation was undertaken.

Any investigation such as that contained in this report can examine only a fraction of the subsurface conditions at the site. There remains a risk that pockets of contamination or other hazards may not be identified as investigations are necessarily based on sampling at localised points. Certain indicators or evidence of hazardous substances or conditions may have been outside the portion of the subsurface investigated or monitored, and thus may not have been identified or their full significance appreciated. As such, the identified environmental conditions reported are only valid at the points of direct sampling and any derived or interpolated conditions may differ from these targeted locations and cannot be assumed to be indicative of the remainder of the site.

The methodology adopted and the sources of information used are outlined in this report. Mott MacDonald has limited its investigation to the scope agreed for this contract and it is possible that additional sampling and analysis could produce different results and/or opinions. Mott MacDonald has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions.

This assessment assumes that the proposed development meets requirements as outlined in the Building Code of Australia and Australian Standards. If these recommendations are not met, there is potential for the exposure and therefore risk to building users to be higher than that presented in this assessment.

The soil descriptions contained in this report have not been prepared for engineering design purposes and the reinstatement of any sampling locations were not conducted in accordance with any supervised filling or geotechnical standard. The term suitable has been used in the context of a request from the planning authority and means that the concentrations reported did not exceed the guideline concentrations adopted for the proposed land use/exposure pathway.

This report does not include the assessment or consideration of hazardous building materials, including asbestos. Such materials should be assessed and managed by a qualified and licensed assessor/contractor.

In general, the available scientific information pertaining to contamination is insufficient to provide a thorough understanding of all of the potential toxic properties of chemicals to which humans may be exposed. The majority of the toxicological knowledge of chemicals comes from experiments with laboratory

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animals, where there may be interspecies differences in chemical absorption, metabolism, excretion and toxic response. There may also be uncertainties concerning the relevance of animal studies using exposure routes that differ from human exposure routes. In addition, the frequent necessity to extrapolate results of short-term or subchronic animal studies to humans exposed over a lifetime has inherent uncertainty. Therefore, in order to conduct an environmental assessment, it is necessary to take into account these inherent uncertainties and extrapolate information from the data that is available, considered current and endorsed as acceptable for the assessment of risks to human health. There is therefore inherent uncertainty in the process, and to compensate for uncertainty, conservative assumptions are often made that result in an overestimation rather than an underestimation of risk.

All advice, opinions or recommendations contained in this document should be read and relied upon only in the context of the document as a whole. This report does not purport to give legal advice as this can only be given by qualified legal practitioners. This document does not represent a Site Contamination Audit Report.

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Appendices

Appendix A. Certificate of title 22
Appendix B. DEWNR groundwater data 23
Appendix C. Historical aerial photographs 24
Appendix D. Dangerous goods licence search results 25
Appendix E. Section 7 search results 26
Appendix F. State Library of South Australia almanac and directory search results 27
Appendix G. Asbestos register 28

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Appendix A. Certificate of title

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Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	02/11/2015 01:46PM
Customer Reference	
Order ID	20151102006437
Cost	$279.00

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Registrar-General

Certificate of Title - Volume 6130 Folio 16

REAL PROPERTY ACT, 1886
South Australia

Parent Title(s)	CT 5526/586
Dealing(s) Creating Title	DDA 12075267
Title Issued	05/02/2014
Edition	1
Edition Issued	05/02/2014

Estate Type

FEE SIMPLE

Registered Proprietor

FAMUS PTY. LTD. (ACN: 009 326 345)
OF 883 WELLINGTON STREET WEST PERTH WA 6005

Description of Land

ALLOTMENT 25 DEPOSITED PLAN 49351
IN THE AREA NAMED KENT TOWN
HUNDRED OF ADELAIDE

Easements

NIL

Schedule of Dealings

Dealing Number	Description
8499084	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
10471297	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

Notations

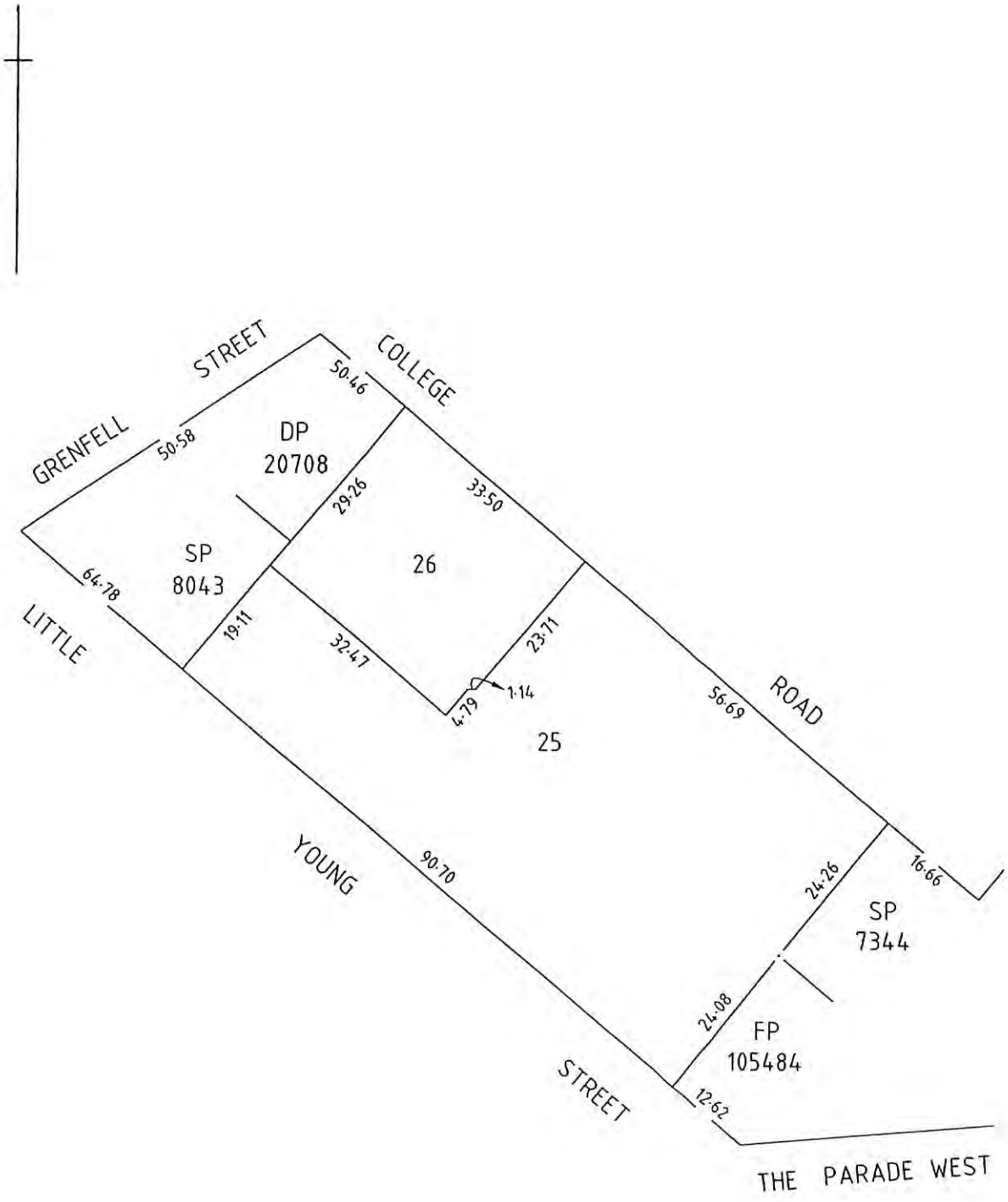
Dealings Affecting Title

NIL

Priority Notices

Copyright Privacy Disclaimer: www.sailis.sa.gov.au/home/showCopyright www.sailis.sa.gov.au/home/showPrivacyStatement www.sailis.sa.gov.au/home/showDisclaimer

Product	Register Search
Date/Time	02/11/2015 01:46PM
Customer Reference	
Order ID	20151102006437
Cost	$279.00



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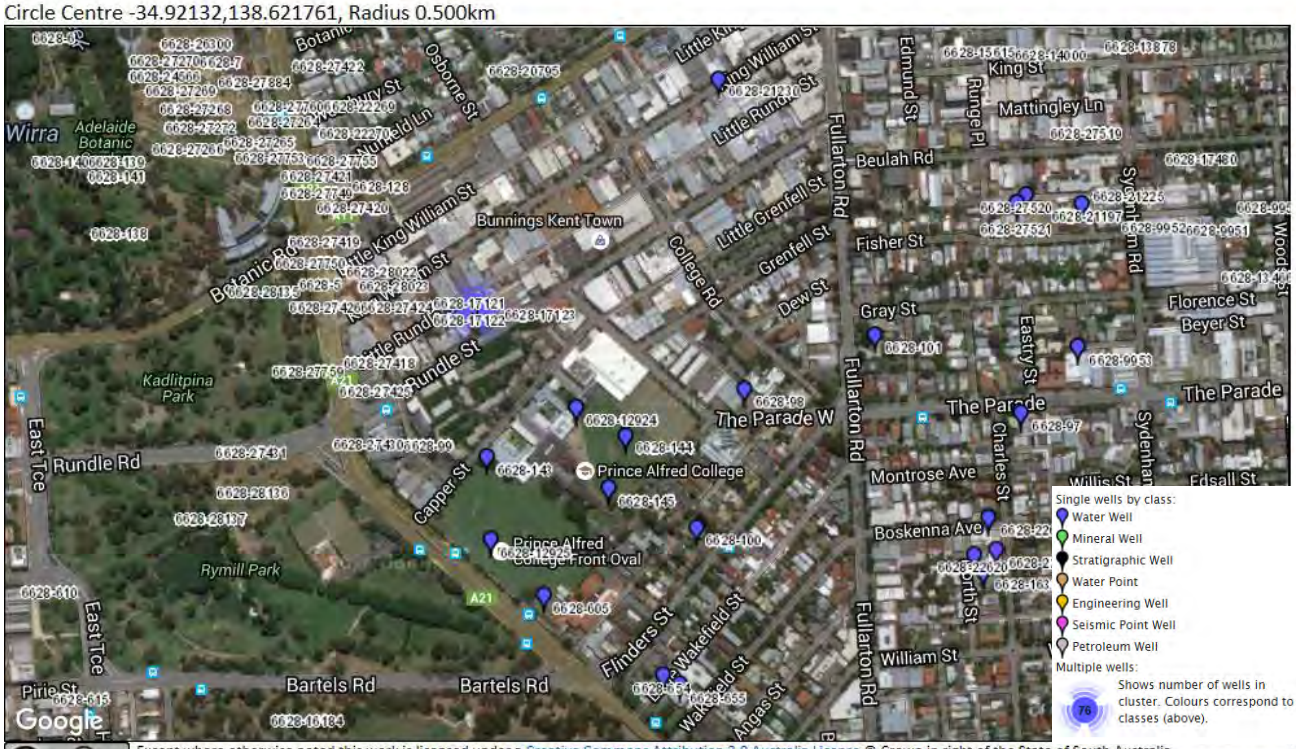
Appendix B. DEWNR groundwater data

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Government of South Australia

WaterConnect

Circle Centre -34.92132,138.621761, Radius 0.500km



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WaterConnect

Groundwater Data Report

Government of South Australia
Department of Environment, Water and Natural Resources

Circle Centre -34.92132,138.621761, Radius 0.500km

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	TDS (mg/L)	TDS Date	Date	Cased To (m)	Yield (L/sec)	Yield Date	Purpose	Obs No	SWL Status	Salinity Status	Aquifer	Status	Permit No
6628-97	11.99	11.99	9.25	19/07/1934	1028	19/07/1934											
6628-98	6.71	6.71			1257	09/10/1914											
6628-100	10.06	10.06			1499	10/12/1914											
6628-101	15.24	15.24			1100	28/10/1914											
6628-143	13.72	13.72			350	05/04/1976	01/01/1964	13.72	2.5	01/01/1976	OBS						
6628-144	39.62	39.62					01/01/1955	39.62	0.76	01/01/1976							
6628-145	22.86	22.86	7.95	21/09/1991	1245	15/01/1992	01/01/1971	22.86				ADE051	H	N	Qpah	NIU	
6628-605	27.43	0	7.05	21/11/1979	1105	18/12/1974	06/05/1968		2.27	06/05/1968		ADE026	H	H		BKF	
6628-654	18.9	0	8.53	17/10/1934	1128	17/10/1934										BKF	
6628-655	12.19	12.19			1885	20/11/1914											
6628-9953	14.02	14.02			1128	12/07/1934											
6628-12924	27	27	5.4	14/02/1984	1160	14/02/1984	14/02/1984	17.5	1.38	14/02/1984	TWS					OPR	13790
6628-12925	94.4	94.4	8.4	13/02/1984	1306	11/02/1984	13/02/1984	11	0.75	13/02/1984	TWS					OPR	13789
6628-16364	15	15			1010	06/01/1993	17/12/1992	15			DOM						27539
6628-17121	6.2	6.2					29/01/1995	6.2			INV						34057
6628-17122	7	7					29/01/1995	7			INV						34058
6628-17123	8	8					29/01/1995	8			INV						34059
6628-17124	10	10	4.3	28/01/1995			28/01/1995	10			INV						34060
6628-17125	7.7	7.7					29/01/1995	7.7			INV						34061
6628-21197	8	8					12/06/2003	5			INV						
6628-21230	11	11	8	07/01/2003			07/01/2003	11			MON						60544
6628-22619	8.5	8.5	5.2	26/07/2006			26/07/2006	8.5			INV						119364
6628-22620	9	9	5.2	26/07/2006			26/07/2006	6			INV						119365
6628-22621	6.2	6.2	3.6	27/07/2006			27/07/2006	3.2			INV						119366
6628-27520	9	9	6.8	18/09/2014				6			INV						236631
6628-27521	9	9	6.8	18/09/2014			18/09/2014	6			INV						236630

26 records

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Appendix C. Historical aerial photographs

Draft for client review



Photograph A: Site and surrounding area in 2005, showing approximate site boundary (source: DEWNR)



Photograph B: Site and surrounding area in 1999, showing approximate site boundary (source: DEWNR)



Photograph C: Site and surrounding area in 1989, showing approximate site boundary (source: DEWNR)



Photograph D: Site and surrounding area in 1979, showing approximate site boundary (source: DEWNR)



Photograph E: Site and surrounding area in 1968, showing approximate site boundary (source: DEWNR)



Photograph F: Site and surrounding area in 1959, showing approximate site boundary (source: DEWNR)



Photograph G: Site and surrounding area in 1949, showing approximate site boundary (source: DEWNR)

Appendix D. Dangerous goods licence search results

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Appendix E. Section 7 search results

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Environment Protection Authority
www.epa.sa.gov.au

GPO Box 2607 Adelaide SA 5001
250 Victoria Square Adelaide SA
T (08) 8204 2000 F (08) 8204 2020
Country areas 1800 623 445

Mott MacDonald
PO BOX 3400 Rundle Mall
ADELAIDE SA 5000

Rebecca.Lucock@mottmac.com.au

Contact: Section 7
Telephone: (08) 8204 2026
Email: epasection7@sa.gov.au

Contact: Public Register
Telephone: (08) 8204 9128
Email: epa.publicregister@sa.gov.au

26 April, 2016

EPA STATEMENT TO FORM 1 - CONTRACTS FOR SALE OF LAND OR BUSINESS

The EPA provides this statement to assist the vendor meet its obligations under section 7(1)(b) of the *Land and Business (Sale and Conveyancing) Act 1994*. A response to the questions prescribed in Schedule 1-Contracts for sale of land or business-forms (Divisions 1 and 2) of the *Land and Business (Sale and Conveyancing) Act 1994* is provided in relation to the land.

I refer to your enquiry concerning the parcel of land comprised in

Title Reference	CT Volume 6130 Folio 16
Address	Allotment 25 (D49351), College Road, KENT TOWN SA 5067

Schedule – Division 1 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS OF MORTGAGES, CHARGES AND PRESCRIBED ENCUMBRANCES AFFECTING THE LAND

7. Environment Protection Act 1993

Does the EPA hold any of the following details relating to the *Environment Protection Act 1993*:

7.1	Section 59 - Environment performance agreement that is registered in relation to the land.	NO
7.2	Section 93 - Environment protection order that is registered in relation to the land.	NO
7.3	Section 93A - Environment protection order relating to cessation of activity that is registered in relation to the land.	NO
7.4	Section 99 - Clean-up order that is registered in relation to the land.	NO
7.5	Section 100 - Clean-up authorisation that is registered in relation to the land.	NO
7.6	Section 103H - Site contamination assessment order that is registered in relation to the land.	NO
7.7	Section 103J - Site remediation order that is registered in relation to the land.	NO

7.8	Section 103N - Notice of declaration of special management area in relation to the land (due to possible existence of site contamination).	NO
7.9	Section 103P - Notation of site contamination audit report in relation to the land.	NO
7.10	Section 103S - Notice of prohibition or restriction on taking water affected by site contamination in relation to the land.	NO

Schedule – Division 2 – *Land and Business (Sale and Conveyancing) Regulations 2010*

PARTICULARS RELATING TO ENVIRONMENT PROTECTION

3-Licences and exemptions recorded by EPA in public register

Does the EPA hold any of the following details in the public register:

a)	details of a current licence issued under Part 6 of the *Environment Protection Act 1993* to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
b)	details of a licence no longer in force issued under Part 6 of the *Environment Protection Act 1993* to conduct, at the land-	
i)	a waste or recycling depot (as referred to in clause 3(3) of Schedule 1 Part A of that Act); or	NO
ii)	activities producing listed wastes (as referred to in clause 3(4) of Schedule 1 Part A of that Act); or	NO
iii)	any other prescribed activity of environmental significance under Schedule 1 of that Act?	NO
c)	details of a current exemption issued under Part 6 of the *Environment Protection Act 1993* from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
d)	details of an exemption no longer in force issued under Part 6 of the *Environment Protection Act 1993* from the application of a specified provision of that Act in relation to an activity carried on at the land?	NO
e)	details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to operate a waste depot at the land?	NO
f)	details of a licence issued under the repealed *Waste Management Act 1987* to operate a waste depot at the land?	NO
g)	details of a licence issued under the repealed *South Australian Waste Management Commission Act 1979* to produce waste of a prescribed kind (within the meaning of that Act) at the land?	NO

h)	details of a licence issued under the repealed *Waste Management Act 1987* to produce prescribed waste (within the meaning of that Act) at the land?	NO

4-Pollution and site contamination on the land - details recorded by the EPA in public register

Does the EPA hold any of the following details in the public register in relation to the land or part of the land:

a)	details of serious or material environmental harm caused or threatened in the course of an activity (whether or not notified under section 83 of the *Environment Protection Act 1993*)?	NO
b)	details of site contamination notified to the EPA under section 83A of the *Environment Protection Act 1993*?	NO
c)	a copy of a report of an environmental assessment (whether prepared by the EPA or some other person or body and whether or not required under legislation) that forms part of the information required to be recorded in the public register?	NO
d)	a copy of a site contamination audit report?	NO
e)	details of an agreement for the exclusion or limitation of liability for site contamination to which section 103E of the *Environment Protection Act 1993* applies?	NO
f)	details of an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the *Environment Protection Act 1993?*	NO
g)	details of an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the *Environment Protection Act 1993?*	NO
h)	details of a notification under section 103Z(1) of the *Environment Protection Act 1993* relating to the commencement of a site contamination audit?	NO
i)	details of a notification under section 103Z(2) of the *Environment Protection Act 1993* relating to the termination before completion of a site contamination audit?	NO
j)	details of records, held by the former *South Australian Waste Management Commission* under the repealed *Waste Management Act 1987*, of waste (within the meaning of that Act) having been deposited on the land between 1 January 1983 and 30 April 1995?	NO

5-Pollution and site contamination on the land - other details held by EPA

Does the EPA hold any of the following details in relation to the land or part of the land:

a)	a copy of a report known as a "Health Commission Report" prepared by or on behalf of the *South Australian Health Commission* (under the repealed *South Australian Health Commission Act 1976*)?	NO
b)	details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site contamination assessment proposal under section 103I of the *Environment Protection Act 1993?*	NO
c)	details (which may include a report of an environmental assessment) relevant to an agreement entered into with the EPA relating to an approved voluntary site remediation proposal under section 103K of the *Environment Protection Act 1993*?	NO

d)	a copy of a pre-1 July 2009 site audit report?	NO
e)	details relating to the termination before completion of a pre-1 July 2009 site audit?	NO

All care and diligence has been taken to access the above information from available records. Historical records provided to the EPA concerning matters arising prior to 1 May 1995 are limited and may not be accurate or complete and therefore the EPA cannot confirm the accuracy of the historical information provided.

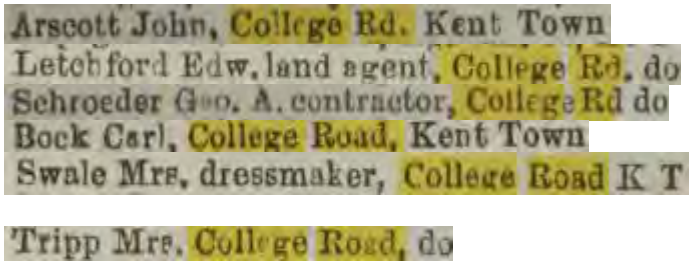
Appendix F. State Library of South Australia almanac and directory search results

Draft for client review

Table A: Summary of likelihood that snips relate to site of interest

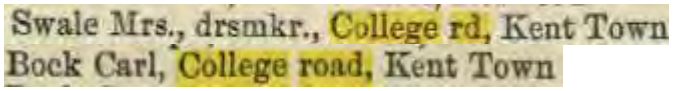
Year Span (Inclusive)	Likelihood	Explanation
1864-1870	N/A	No mention of College Road.
1871-1883	Very Low	No street summary, therefore could be anywhere on College Road.
1884-1893	First reference: Medium Second reference: High	No street numbering, however from interrogation of years following the first name listed has a medium likelihood of being situated on the site of interest and the second has a high likelihood of being situated on the site.
1894-1913	21: Medium 23: High	Street numbering provided. Street numbers are two lower than 1914 and beyond, seemingly due to a numbering change. Consistent resident names confirm probable change of numbering.
1914-1973	23: Medium 25: High 27: High	A historical aerial photograph of 1968 shows a vacant lot from, according to Sands and MacDougal, street number 19-27. Overlaying with the site of interest boundaries, it would seem as though street numbers 27 and 25 would have a high likelihood of being situated on the site of interest, and to best capture any uncertainty, 23 has also been included as having a medium likelihood of being situated on the site.

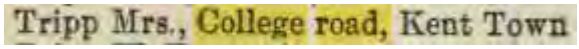
1871


Arscott John, College Rd. Kent Town
Letchford Edw. land agent, College Rd. do
Schroeder Geo. A. contractor, College Rd do
Bock Carl, College Road, Kent Town
Swale Mrs. dressmaker, College Road K T

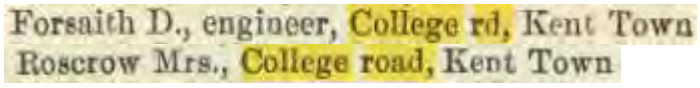
Tripp Mrs. College Road, do

1872


Swale Mrs., drsmkr., College rd, Kent Town
Bock Carl, College road, Kent Town

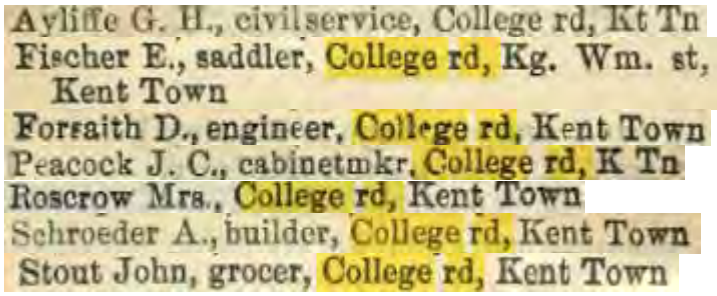

Tripp Mrs., College road, Kent Town

1873


Forsaith D., engineer, College rd, Kent Town
Roscrow Mrs., College road, Kent Town


Tripp Mrs., College road, Kent Town

1874


Ayliffe G. H., civilservice, College rd, Kt Tn
Fischer E., saddler, College rd, Kg. Wm. st, Kent Town
Forsaith D., engineer, College rd, Kent Town
Peacock J. C., cabinetmkr, College rd, K Tn
Roscrow Mrs., College rd, Kent Town
Schroeder A., builder, College rd, Kent Town
Stout John, grocer, College rd, Kent Town

Swale J. J., storeman, College rd, Kent Town
Thwaites W. Jas., College rd, Kent Town

1875

Abbott R., watchmaker, College rd., Kent Tn
Ayliffe G. H., civil service, College rd, Kt Tn
Martin H., ironmonger, College rd, Kt Tn
Nienhaber O. A., piano tnr, College rd, Kt Tn
Peacock J. C., cabinetmkr, College rd, Kt Tn
Stout John, grocer, College rd, Kent Town
Thorpe Henry, folder, College rd, Kent Twn

1876

Abbott R., watchmaker, College rd, Kent Tn
Bates W., ironmongers' asst, College rd, Kt Tn
Peacock J. C., cabint-mkr, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Sloan Walter, compositor, College rd, Kt Tn
Stout John, grocer, College rd, Kent Tn
Thorpe Henry, folder, College rd, Kent Twn

1877

Abbott R., watchmaker, College rd, Kent Tn
Bates W., ironmongers' asst, College rd, Kt Tn
Martin H. M., accountant, College rd, Kt Tn
Muirhead Robt, painter, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Sloan Walter, compositor, College rd, Kt Tn
Stout John, grocer, College rd, Kent Tn
Thorpe Henry, folder, College rd, Kent Twn

1878

Abbott R., watchmaker, College rd, Kent Tn
Hamilton A. R., architect, College rd, Kt Tn
Martin H. M., accountant, College rd, Kt Tn
Muirhead Robt, painter, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Thorpe Henry, folder, College rd, Kent Twn

1879

Abbott R., watchmaker, College rd, Kent Tn
Hamilton A. R., architect, College rd, Kt Tn
Muirhead Robt, painter, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Thorpe Henry, folder, College rd, Kent Twn

1880

Abbott R., watchmaker, College rd, Kent Tn
Barnes C., brewer, College Rd, Kent Town
Donaldson J. J., clerk, College rd, Kent Tn
Hamilton A. R., architect, College rd, Kt Tn
Moxon Arthur, b'kkeepr, College rd, Kt Tn
Priess A., gas fitter, College rd, Kent Town
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Tn
Tavener Mrs, drssmkr, College rd, Knt Twn
Thorpe Henry, folder, College rd, Kent Twn
Wilkins Thos, signpainter, College rd, Kt Tn

1881

Abbott R., watchmaker, College rd, Kent Tn
Barnes C., brewer, College Rd, Kent Town
Hamilton R. A., architect, College rd, Kt Tn
Hitchin G. P., clerk, College rd, Kent Town
Moxon Arthur, b'kkeepr, College rd, Kt Tn
Priestly A., bldr, College rd, Grenfell st, Kt Tn
Rendall J., compositor, College rd, Kent Tn
Rogers Geo, blacksmith, College rd, Kt Twn
Tavener Mrs, drssmkr, College rd, Knt Twn
Thorpe Henry, folder, College rd, Kent Twn

1882

Barnes C., brewer, College Rd, Kent Town
Dadswell T. D, plasterer, College rd, Kt Town
Hamilton R. A., architect, College rd, Kt Tn
Hitchin G. P., civil serv, College rd, Knt Twn
Moxon A., bookkeepr, College rd, Kent Tn
O'Mahoney John J., accountant, College rd
O'Mahoney P. J., civil engineer, College rd
Pittman Lambrook, coachtrimmer, College rd
Rendall J., compositor, College rd, Kent Tn
Tavener Mrs, drssmkr, College rd, Knt Twn
Tubbs Harry, vocalist, College rd, Knt Twn

1883

Barnes C., brewer, College Rd, Kent Town
Carlier Rchd B., butcher, College rd, Kt Tn
Chapman Miss, teacher, College rd, Knt Tn
Hitchin G. P., cvl srv, College rd, Knt Twn
Hughes Wm, bookslr, College rd, Knt Twn
Kennedy Hugh, grdnr, College rd, Kent Twn
Moxon A., bookkeepr, College rd, Knt Twn
O'Mahoney John J., accountant, College rd
O'Mahoney P. J., civil engineer, College rd

Pitman Sam, cochbldr, College rd, Knt Twn
Pittman Lambrook, coachtrimmer, College rd
Rendall J., compositr, College rd, Kent Twn
Tavener Mrs, drssmkr, College rd, Knt Twn
Thorpe Henry, printer, College rd, Knt Twn
Woolcock Elisha, crpntr, College rd, Knt Tn

1884 – Introduction of Kent Town summary, increase in likelihood of situation on site of interest

Davis, David, gentleman
Schmidt, Mrs James

1885

Davies, David

1886

Davies, David
Moore, Maurice, plasterer

1887

Davies, David
Burgess, Geo, modeller

1888

Davies, David
Burges, George, modeller

1889

Davies, David
Burges, George, modeller

1890

Simms, Harry, sharebroker
Burgess, George, modeller

1891

Simms, Harry, sharebroker
Burgess, George, modeller

1892

Combe, Harvey E, solicitor
Burgess, George, modeller

1893

Combe, Harvey E.
Burgess, George, modeller

1894 – increase in certainty of position on site due to the introduction of numbering

21 Combe, Harvey E.
23 Burgess, George, modeller

1895

21 Hitchcox, Jos
23 Burgess, Geo, modlr

1896

21 Hitchcox, Jos
23 Burgess, Geo, modlr

1897

21 Hitchcox, Mrs Frances
23 Burgess, Geo, modlr
Burgess, Mrs, strkpr

1898

21 Hitchcox, Mrs Frances

1899

21 Hitchcox, Mrs Frances
23 Burges, Mrs J.

1900

21 Hitchcox, Mrs Frances
23 Burges, Mrs J, strkpr

1901

21 Miller, Herman
23 Burges, Mrs J, strkpr
Burges, Jno

1902

21 Miller, Herman
23 Burges, Mrs J, strkpr
Burges, Geo

1903

21 Miller, Herman
23 Burgess, Mrs J, strkpr
Burgess, Geo

1904

21 Miller, Herman
23 Burges, Mrs J, strkpr
Burges, Geo

1905

23 Burges, Mrs J, strkpr
Burges, Geo

1906

1907

21 Gainford, Rev H. (Con)
23 Hemmingway, J. N, gen store

1908

21 Gainford, Rev H. (Cong)
23 Dreyer, F. E, strkpr

1909

21 Gainford, Rev H. (Cong)
23 Dreyer, Mrs M, strkpr

1910

21 Gainford, Rev H. (Cong)
23 Dreyer, Mrs M, strkpr

1911

21 Harris, C, cvl ser
23 Dreyer, Mrs M, strkpr

1912

21 Harris, C. D, cvl ser
23 Dreyer, Mrs M, strkpr

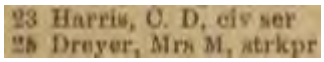
1913

21 Harris, C. D, cvl ser
23 Dreyer, Mrs M, strkpr

1914 – numbers appear to have been increased by two

23 Harris, C. D, cvl ser
25 Dreyer, Mrs M, strkpr

1915


23 Harris, C. D, civ ser
25 Dreyer, Mrs M, strkpr

1916


23 Harris, C. D, civ ser
25 Dreyer, Mrs M, strkpr

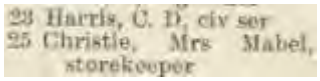
1917


23 Harris, C. D, civ ser
25 Dreyer, Mrs M, strkpr

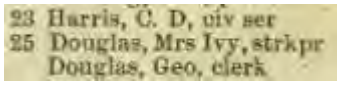
1918


23 Harris, C. D, civ ser
25 Hawkes, R. G, strkpr

1919


23 Harris, C. D, civ ser
25 Christie, Mrs Mabel, storekeeper

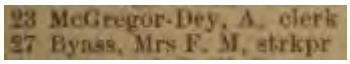
1920


23 Harris, C. D, civ ser
25 Douglas, Mrs Ivy, strkpr
Douglas, Geo, clerk

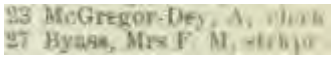
1921


23 Harris, C. D, civ ser

1922


23 McGregor-Dey, A, clerk
27 Byass, Mrs F. M, strkpr

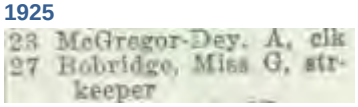
1923


23 McGregor-Dey, A, clerk
27 Byass, Mrs F. M, strkpr

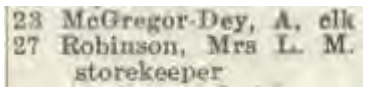
1924


23 McGregor-Dey, A, clk
27 Bobridge, Miss G, str-keeper

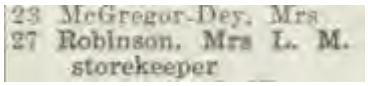
1925


23 McGregor-Dey, A, clk
27 Bobridge, Miss G, str-keeper

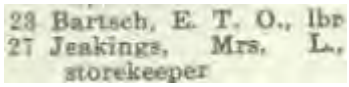
1926


23 McGregor-Dey, A, clk
27 Robinson, Mrs L. M. storekeeper

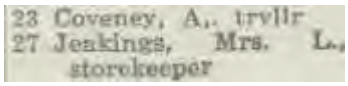
1927


23 McGregor-Dey, Mrs
27 Robinson, Mrs L. M. storekeeper

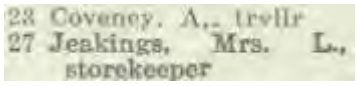
1928


23 Bartsch, E. T. O., lbr
27 Jeakings, Mrs. L., storekeeper

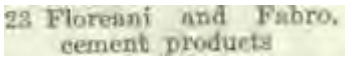
1929


23 Coveney, A., trvllr
27 Jeakings, Mrs. L., storekeeper

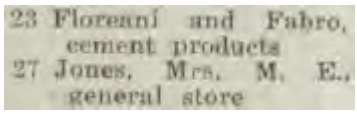
1930


23 Coveney, A., trvllr
27 Jeakings, Mrs. L., storekeeper

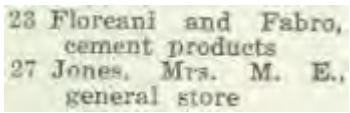
1931


23 Floreani and Fabro, cement products

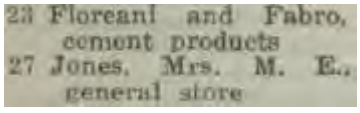
1932


23 Floreani and Fabro, cement products
27 Jones, Mrs. M. E., general store

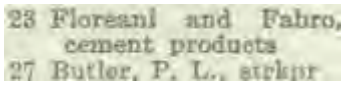
1933


23 Floreani and Fabro, cement products
27 Jones, Mrs. M. E., general store

1934


23 Floreani and Fabro, cement products
27 Jones, Mrs. M. E., general store

1935


23 Floreani and Fabro, cement products
27 Butler, P. L., strkpr

1936


23 Floreani cmnt prdcts
27 Butler, P. L., strkpr

1937

21-23 Smith, —.
27 Willoughby, T. J., mx bas and milk depot

1938

21-23 Smith, G.
Stanley, Mrs. I. L.
Proser, —
Willoughby, Mrs B.A.
27 Hocking, M. M.

1939

21-23 Waldron, Mis
27 Hocking, M. M.

1940

21-23 Waldron, Miss
27 Hocking, M. M.

1941

21-23 Waldron, Miss
27 Hocking, M. M., mxd business

1942

21-23 Flats
27 Hocking, M. M., mxd business

1943

21-23 Flats
27 Cogan, Mrs

1944-45

21-23 Flats
27 Cogan, Mrs., mxd bus

1946

21-23 Flats
27 Hughes, G. I., mxd bs

1947

21-23 Flats
27 Hughes, G. I., mxd bs

1948

21-23 Flats
27 Hughes, G. I., mxd bs

1949

23 Archer, Miss E. M.
23 Merton, O., rl emp
23 Blacketer, H.
23 Prosser, W. G.
23 Hughes, L. V., txi dvr
27 Miller, J. J., mxd bus

1950

23 Archer, Miss E. M.
23 Merton, O., rl emp
23 Blacketer, H.
23 Prosser, W. G.
23 Hughes, L. V., txi dvr
27 Miller, J. J., mxd bus

1951

23 Archer, Miss E. M.
23 Merton, O., rl emp
23 Blacketer, H.
23 Prosser, W. G.
23 Blinman, Mrs, D. B.
27 Constant, A. K., mxd bsns

1952

23 Archer, Miss E. M.

23 Merton, O., rl emp
3 Blacketer, H.
23 Prosser, W. G.
23 Blinman, Mrs. D. B.
27 Constant, A. K., mxd bsns

1953

23 Archer, Miss E. M.

23 Merton, O., rl emp
3 Blacketer, H.
23 Prosser, W. G.
23 Blinman, Mrs, D. B.
27 Constant, A. K., mxd bsns

1954

23 Merton P R dneng tchr
23 Blinman Mrs D E
27 Constant A K mxd bsns

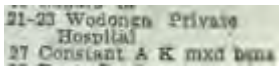
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21-23 Wodonga Private Hospital
27 Constant A K mxd bsns

1956

21-23 Wodonga Private Hospital
27 Constant A K mxd bsns

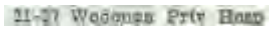
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1958



1959



1960



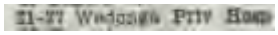
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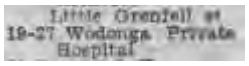
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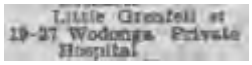
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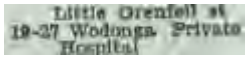
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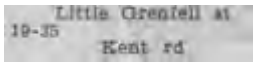
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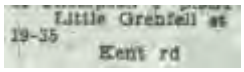
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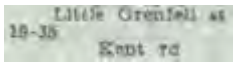
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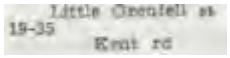
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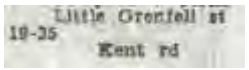
1971



1972



1973



Appendix G. Asbestos register

Draft for client review

ANNEXURE E

Asbestos Register

Carters
Asbestos Management

REGISTER: AS 1976

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
A. Building external eaves lining (facing north east, level 3) – fibre cement sheet set on a 45 degree angle.	Approx 24m² Limited access	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

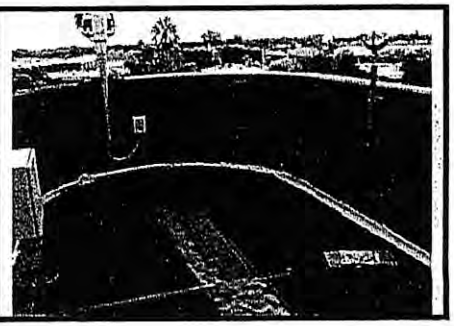
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Good Sealed Non friable	Sample 01/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

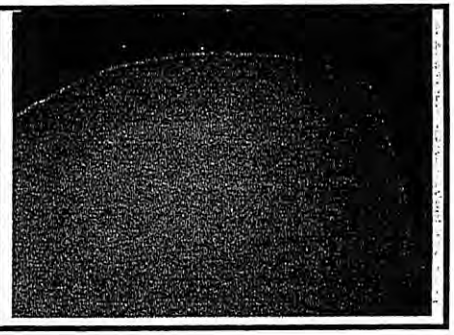
Low Risk P4 –Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Note the tower containing the A/C duct appeared to have a new rubber membrane coating to the tower surface. The presence of asbestos membrane at this tower could not be verified.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B1. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Poor Unsealed Non friable	Sample 01/GS/270412.	Not required

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

December 2012 – Asbestos Maintenance Works completed on the North Tower where access had been restricted per management plan adopted from April 2012 update. North tower has been made safe / vacuumed dust / debris and wet wiped floor area under monitored conditions, before applying a paint base coat to seal the membrane floor area only. Refer to certificate of completion form and air-monitoring clearance report 13/12/12, emailed to building owner for inclusion into the register.
April 2012 - High Risk P2 Restrict access. Dust residue and debris visible on roof from high traffic use. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Asbestos Approved Code of Practice". Recommend implement a safe access system to prevent further abrasion damage to the surface.



Asbestos Audit update after new tower removal work.

Carters
Asbestos Management

- **Asbestos Registers & Annual Updates**
- **Asbestos Repairs & Maintenance**
- **Asbestos Training & Support**
- **Asbestos Removal**
- **Asbestos Advice & Consultancy**
- Asbestos Safety Products

CERTIFICATE OF COMPLETION (MAINTENANCE)

DATE OF WORK	12/12/2012	REGISTER or JOB No.:	1979	ENQUIRY No.:	12219
PERSONS CARRYING OUT WORK	Willie Harris				
PROPERTY ADDRESS	Bureau of Meteorology, 25 College Road, Kent Town				
NAME OF CLIENT AUTHORIZING WORK TO PROCEED	Mr John Squarcini				

Work Carried Out (Brief Scope)

North tower make safe – vacuum, scrub / wet wipe surface of asbestos containing bituminous membrane floor covering of the under air monitored conditions.
Once all clear given, paint seal bituminous floor covering (base coat) 12/12/2012.
Apply second / final paint coat 13/12/2012

TICK	ITEM NO'S	DESCRIPTION OF WORK
☐		Item removed in accordance with "Approved Code of Practice".
☒	B	Dust and debris cleaned up using approved asbestos rated vacuum system in accordance with "Approved Code of Practice".
☐		Asbestos waste collected and disposed of in accordance with EPA requirements.
☒	B	Item made safe in accordance with "Approved Code of Practice".
☒	B	"All Clear" air monitoring certificate attached (where applicable).
☐		Caution signs installed in accordance with safe work method and SOP.
☐		Samples taken in accordance with safe work method and SOP.
☐		Other (SPECIFY)

Standard Operating Procedure Used / Safe Work Method

☐ SOP 3.2 **Removal of Asbestos Cement and Resin Boards**	☐ SOP 3.3 **Removal of Vinyl Tiles**	☒ SOP 3.5 **Vacuum Use**
☒ SOP 3.6 **Making Safe Asbestos Containing Materials**	☐ SOP 3.7 **Transport and Disposal of Waste**	☐ SOP 3.8 **Collection of Waste**
☐ SOP 3.9 **Installing Caution Signs**	☐ SOP 3.10 **Installing Register Holder**	☐ SOP 1.3 **Sample Taking**
☐ OTHER		

Job Notes / Qualifications / Limitations of Removal (if any - Use back of sheet for further notes if required)

Signed : WGH **Date:** 13-12-2012

Carter Corporation Pty Ltd 42 Trenbath Street Bowden SA 5007
P (08) 8346 2999 F (08) 8346 3888 E enquiries@cartercorporation.com.au W www.cartercorporation.com.au
ABN 58 007 881 763 Asbestos Lic 72803 EPA Lic 13933 AS4801 OH&S Accredited

Adelaide Asbestos Audits & Monitoring

REPORT OF ANALYSIS

Report Number:	**RN 01644**	**Client Order Number:**	AS1979e12219WH
Reference Code:	CART01-121212-MS	**Approval Number:**	n/a

Air monitoring in accordance with the National Occupational Health and Safety Commission guidance note on the membrane filter method for estimating airborne asbestos dust was carried out concluding on the **12-Dec-12**

at **Bureau of Meteorology 25 College Road Kent Town**

on behalf of **Carter Corporation**

The spreadsheets of results attached, indicate that during the monitoring sessions the areas tested were well below the Worksafe Australia Exposure Standard of 0.1 fibres /mL.

This report should not be considered as a contractual document and should not be reproduced except in full.

Mark Seater
Approved Analyst
12-Dec-12

Adelaide Asbestos Audits Monitoring
49 Heath Street, Birkenhead SA 5015
Mobile: 040 040 1972 Fax 08 8242 4969
E-mail: adelaideasbestos@bigpond.com.au

Adelaide Asbestos Audits and Monitoring

AIRBORNE ASBESTOS FIBRE MONITORING

Site: Bureau of Meteorology 25 College Road Kent Town

Client: Carter Corporation **Date:** 12-12-2012

Job Name: CART01-121212-MS **Approval:** n/a **LRN:** 12-000353

Location	Activity	Time On	Run Time	Flow Rate (ml/min)	Fibres Conc. (per mL)
Northern tower stairwell	G	0822	135	3000	<0.01
Northern tower roof	G	0822	135	3000	<0.01

G = Background C= Clearance F = Final Clearance B= Waste Removal
S = Plastic Stripdown

The Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Source D Update) 2003 [NOHSC:1003(1995)] requires a Fibre Concentration of no more then 0.1 fibres per mL

Analyst: Mark Seater

49 Heath Street Birkenhead 5015
Tel: 040 040 1972 Fax: +61 8 8242 4969

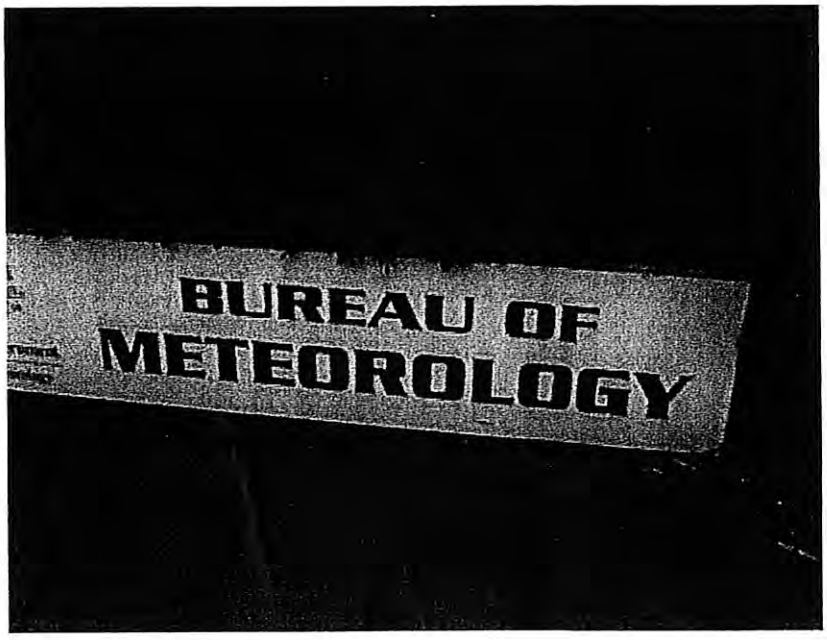
Procedure: AAAM - 01

Carters
Asbestos Management

- Asbestos Audits.
- Asbestos Management.
- Asbestos Consultancy.
- Asbestos Maintenance.
- Asbestos Training.
- Asbestos Safety Products.

ASBESTOS AUDIT

REGISTER NO.:	**AS1979**
FOR THE PROPERTY AT:	**Bureau Of Meteorology** **25 College Road** **Kent Town, SA**
CLIENT:	**Squarcini Group of Companies**
REGISTER CONTROLLER:	**Mr John Squarcini**
CONSULTANT:	**George Sheaffer**
DATE INSPECTED:	**27/04/2012**



CARTER CORPORATION PTY. LTD.
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Email: enquiries@cartercorporation.com.au
Web: www.cartercorporation.com.au
ABN 58 007 881 763

CONTENTS

		Page
1	INTRODUCTION	1
2	SCOPE OF WORKS	1
3	LIMITATIONS	2
4	METHODOLOGY	3
5	EXAMPLES OF ASBESTOS CONTAINING MATERIALS	4
6	DEFINITIONS	5
7	RISK SCORE CALCULATOR	7
8	REFERENCE	8

APPENDICES

APPENDIX A – ASBESTOS REGISTER

APPENDIX B – CERTIFICATES OF ANALYSIS

APPENDIX C – REGISTER DRAWING

APPENDIX D – FORMS

1. INTRODUCTION

Carter Corporation Pty Ltd (Carter Corporation) was requested to conduct an asbestos re-inspection audit to determine the condition of asbestos containing materials (ACMs) previously identified within the asbestos register at the site/address referred to and contained within this document. The purpose of the audit was to identify and record the location of asbestos containing materials (ACM) and assess the condition as required by the State/Territory Regulations (Refer Section 8 Reference).

The audit is a visual re-inspection of previously identified asbestos materials listed in the original register and is not a full inspection of the building. All previous conditions, limitations and recommendations apply.
full inspection of the building. All previous conditions, limitations and recommendations apply.

In accordance with the Regulations, ACMs which have been visually identified (i.e. not sampled or not referenced to a specific sample) should be presumed to contain asbestos, unless sampled to prove otherwise.

It is strongly recommended that this report be reviewed prior to any change of use, occupancy or other activity which may affect the accessibility of any ACMs within the areas surveyed. Such reviews should only be conducted by a competent person.

Further investigations may be required prior to any planned refurbishment or alterations which affect the fabric of the building.

This report may not be reproduced other than in full, except with the prior written approval of the report author.

This report should be read in its entirety.

This report is limited to asbestos containing materials only and their associated risks. Reference may be made within this document to other materials such as but not limited to Synthetic Mineral Fibre (SMF); lead paints etc but no assessment of these have been made.

The objective of the survey was to, as far as reasonably practicable, locate, identify and access and where possible, photograph and quantify all accessible ACM present within the scope of the survey and to present the information collected in a way which allows the duty holder to manage the risks arising from those materials.

2 SCOPE of WORK

To undertake the inspection as required, the following scope of work was undertaken;

- A desktop survey and discussion with site personnel was made to determine the history, previous use, existing asbestos register and previous removals of ACM.
- A site specific risk assessment prior to the survey was undertaken.
- Inspection of the site was carried out.
- Potential ACM their location, type, quantity, condition and stability were documented.
- An assessment of the materials potential to release fibres and recommendations to minimise or manage the risk was noted.
- Photographs were taken (where required) to aid the item identification and condition.
- Signage requirements were noted.
- Samples (where agreed) taken and submitted to a NATA laboratory for analysis to qualify asbestos fibre content.
- Drawings (where supplied) marked up to aid the asbestos location identification.

3 LIMITATIONS

Whilst the surveyors make every reasonable effort, Carter Corporation cannot guarantee that all ACMs have been identified and survey results are definitive. Some ACMs could be present in the building that may only be discovered when the building is demolished or is subject to major refurbishment.

Building owners are not required to dismantle parts of the building or plant to locate asbestos; the regulation is aimed at identifying any significant risk to persons. If it is the intention to demolish or alter such areas, and concealed/unknown asbestos is uncovered / detected, revised safe work practices are to be implemented.

In general, it may be impossible to locate all asbestos during the conduct of a visual inspection. Physical constraints upon an inspection include, but are not limited to, restrictions on access to lift shafts / motor rooms, air conditioning ductworks, During an inspection, there is a need to avoid damage to client's property (e.g. through sample taking) and to minimise disruption (e.g. dismantling equipment), and inconvenience.

The inspection was carried out in areas where access was available. Unless otherwise indicated floor coverings were not taken up to enable inspection of floor surfaces. Equipment in use was not disturbed or opened for the purpose of inspection. Air-conditioning systems, heater banks and associated ductwork has not been inspected.

In some instances asbestos may be located in inaccessible areas such as wall cavities, beneath floor slabs, or as an integral part of machinery, plant or equipment (pumps, pipe work, boilers, heater banks, ductwork and the like). Buried fibro asbestos pipes or pits may also be discovered upon excavation.

Confirmation of lagged pipe work within wall cavities and chased into walls is not possible with a visual inspection. Asbestos that was previously removed from an area may have fallen down cavities due to inadequate removal procedures and clean-up. This should be taken into consideration when any demolition or upgrade work is being done as it is possible that asbestos containing material may be present in these areas.

Unless noted otherwise, samples were not taken of those products which have previously been known to contain asbestos, e.g., "Zelemite" electrical switchboard panels and "Millboard" insulation to wiring (items installed in live electrical situations).

Notes: Any references in this report to materials other than asbestos are not to be taken as necessarily accurate, since identification of such materials is not included within the scope of this report. References to "Colorbond", "PVC", "Rockwool", "Gyprock"', etc are intended to be an approximate indication only of the type of material present based on cursory observation. The purpose of including references to such materials is primarily to assist the author in compiling the report and secondly to provide a more descriptive report.

Measurements and quantities mentioned in this report are approximate only.

This report is not to be used as a contractual document.

No guarantees can be entered into regarding the accuracy or completeness of this report.

The information contained herein is accurate at the time of printing only. Subsequent updates become the responsibility of the register controller.

A reference in this register to the regulations, a Code of Practice, a Guidance Note or Guideline will be taken as a reference to that document as in force at that time.

A reference in this register to the owner of a building will be taken to include a reference to any person appointed by the owner to manage the building on his or her behalf.

4 METHODOLOGY

All accessible areas were thoroughly inspected in order to determine the presence of ACM and findings pertaining to type, condition and extent of the ACM recorded.

To assess the potential health risk posed by the ACM various information and criteria are recorded. The assist in the interpretation of the Asbestos Register the following detailed explanation is provided.

- **LOCATION – DESCRIPTION;** provides identifier (letter for external and number for internal). The identifier is also shown on any drawing provided with the Register. The description states the room number (if assigned), room name, location of the item and material description.

- **EXTENT;** an approximate extent (not be used for pricing or demolition costing).

- **ACCESSIBILITY;**
  Accessible – the material/item can be easily accessed without any aids or key access.
  Limited access – the material/item can by accessed but requires access via ladder, key access, lifting carpet, etc.
  Inaccessible – the material/item cannot be accessed without damage or demolition i.e. metal encapsulated insulation, material within cavity, sealed door core etc.

- **ASBESTOS ASSESSMENT;** asbestos type (from laboratory analysis) or presumed asbestos content.

- **CONDITION;** provides a description of the material at the time of the survey. It comprises of three components-
  Poor – the material is damaged or severely deteriorated.
  Moderate – the material is generally sound condition but has some signs of deterioration.
  Good – The material is sound with no signs of deterioration

  Sealed – the material has a painted or other material sealing the raw product
  Unsealed – the material is raw or has exposed areas of asbestos product

  Non-friable/bonded – the asbestos fibres are in a stable matrix and cannot be crushed by hand application
  Friable – the asbestos product can be crushed or broken down by hand pressure or is dust/debris

- **SAMPLE NO – VISUAL TEST;** provides the unique sample reference number or informs of a visual identification.

Items listed within the Register as "visual" have not been sampled to confirm an asbestos content. These items have been identified as materials which historically have or can contain asbestos. The presumption made is through various criteria such as but not limited to type of material, age of building, similar products, and the experience of the surveyor. All materials which have been listed as visually identified within this register must be treated as asbestos unless proven otherwise by sample analysis. It is recommended that all materials are sampled in order to qualify.

- **SIGNAGE STATUS;** signage is either visible or not visible.

- **SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS;** has specific notes pertaining to the item with recommendations if required. Within this section there is also information relating to Risk Priority. The information gained from the survey or inspection is used to provide a priority rating and is to be used as part of the Asbestos Management Plan. Refer to Section 7 'Risk Score Calculator' for the risk score matrix used within the Register. The matrix is based upon AS4360.

5 EXAMPLES OF ASBESTOS CONTAINING MATERIALS

(This is not an exhaustive list)

Backing to service riser doors
Bitumen based membrane coverings/flashings
Boiler insulation
Brake linings
Cable trays
Chalkboards
Cooling towers
Door linings
Down pipes and gutters
Duct work flexible fabric connections
Eaves/Verandah linings
Electrical cable insulation/sheathing
Electrical meter backing boards
Exhaust insulation and gaskets
Expansion joints and gaskets in boilers
Facades
Fencing
Fibre cement pipes and flues
Fire blankets
Fire doors - internal core
Firewall partitions
Fuse holder insulation
Heater bank/re-heat units insulation within duct work of air conditioning
Hot water service heat shields
Insulation linings for spark/fire resistance
Kitchen plant and equipment
Laboratory gloves
Laboratory hoods, bench tops, and equipment
Lift motor brakes
Limpet insulation to structural beams & columns
Lost form work
Louvres in windows
Mortar in wall and floor penetrations (fire stop)
Oven door seals
Packers under floor joists (for levelling transportables, etc)
Pipe work gaskets
Putty and tapes in expansion joints, construction mastics
Refractory bricks
Residual contamination on ceiling tiles and grids
Roof cladding
Roofing shingles
Sealants to duct work and other air-conditioning plant and equipment
Sheathing/insulation to wiring
Sheeting to wet areas
Taping compounds (thermal)
Textured paints/coatings
Thermal paper products
Vermiculite insulation/decorative plaster finishes
Vinyl floor (lino) backing material
Vinyl floor tiles
Wall and floor penetrations
Wall cavities
Wall linings/cladding

6 DEFINITIONS

Accredited laboratory	A testing laboratory accredited by the National Association of Testing Authorities, Australia (NATA) or a similar accreditation authority, or otherwise granted recognition by NATA, either solely or in conjunction with one or more other persons.
Accessible	In a physical location where building occupants or users might readily access material without use of assistance e.g. asbestos based material used as wall cladding on or outside of equipment in a laboratory etc.
Air monitoring	Airborne asbestos fibre sampling to assist in assessing exposures and the effectiveness of control measures. Air monitoring includes exposure monitoring, control monitoring and clearance monitoring. Note: Air monitoring should be undertaken in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003 (2005)].
Airborne asbestos fibres	Any fibres of asbestos small enough to be made airborne. For the purposes of air monitoring airborne fibres, only respirable asbestos fibres are counted.
Asbestos	The fibrous form of mineral silicates that belong to the serpentine or amphibole groups of rock forming minerals, including Actinolite, Amosite (brown asbestos), Anthophyllite, Crocidolite (blue asbestos), Chrysotile (white asbestos) and Tremolite, or any combination of two or more of these.
Asbestos Abatement	Procedures to control fibre release from asbestos containing materials in a building or to remove it entirely. These may involve removal, encapsulation, repair, enclosure, encasement, and operations and maintenance programs.
Asbestos register	The document containing the results/recommendations following a building audit for asbestos materials, commenting on their location, condition and establishment of safe working policies.
Asbestos removal work	Work involving the removal of a) insulation material that consists of or contains asbestos, or other friable asbestos-containing material; or b) an asbestos-cement (fibro) product, or other non-friable asbestos-containing material.
Asbestos work	Any work where, in the course of that work, exposure to asbestos (or any material that consists of or contains asbestos) may occur.
Asbestos Containing Material (ACM)	Means any material, object, product or debris that contains asbestos.
Asbestos removalist	A competent person who performs asbestos removal work. An asbestos removal licence is required for removal of friable ACM and may also be required for non friable ACM removals, check with relevant OHS authorities for requirements.
Asbestos waste	All removed ACM and disposable items used during the asbestos work, such as plastic sheeting used to cover surfaces in the asbestos work area, disposable coveralls, disposable respirators, rags used for cleaning.
Asbestos work area	An immediate area in which work on ACM is taking place. The boundaries of the asbestos work area must be determined by a risk assessment.
Avoid physical and mechanical damage	As for as practicable, limit activities (cutting, drilling, grinding, sanding, breaking, etc) on or adjacent to material such that sufficient damage to release respirable fibres is avoided.
Breathing zone	A hemisphere extending in front of a persons face, with a radius of 300mm from the midpoint of an imaginary line between the ears.

Competent person	A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of the specific work.
Dust and debris	Visible particles, fragments or chunks of material, large and heavy enough to have settled in the work area, that is likely to have originated from ACM.
Friable (Asbestos)	Asbestos containing material which, when dry, is or may become crumbled, pulverised or reduced to powder by hand pressure.
Hazard	Any matter, thing, process or practice that may cause death, injury, illness or disease.
Inaccessible areas	Areas which are difficult to access, such as wall cavities and the interiors of plant and equipment.
Limited Access	Requiring some assistance or equipment to allow access e.g. requiring a ladder or lifting of ceiling tiles or keys to normally locked cupboard, room etc.
Monitor Condition	Carry out regular general observation of condition of material to note any changes.
NES	National exposure standard
N.O.H.S.C.	The National Occupational Health and Safety Commission (Government Body).
Organic fibre	Fibres such as but not limited to cellulose, wool, cotton
Person with control	In relation to premises, a person who has control of premises used as a workplace. The person with control may be: a The owner of the premises b A person who has, under any contract or lease, an obligation to maintain or repair the premises c A person who is occupying the premises d A person who is able to make decisions about work undertaken at the premises, or An employer at the premises
Personal Protective Equipment	Equipment and clothing that is used or worn by an individual person to protect themselves against, or minimise their exposure to, workplace risks.
Register Controller	A building owner or designated representative who is responsible for the asbestos register and implementation of a hazard management plan.
Risk	The likelihood of a hazard causing harm to a person. In this instance rick relates to illness or disease arising from exposure to Airborne Asbestos Fibres.
SMF	Synthetic Mineral Fibre
Stable	Condition good, posing minimum risk to health.
Unstable	Condition poor, posing significant risk to health.
Work	Any activity, physical or mental, carried out in the course of a business, industry, commerce, an occupation or a profession.
Worker	A person who does work, whether or not for reward or recognition.
Workplace	Any place where a person works.

7 RISK SCORE CALCULATOR

Consequence or Impact

Rating	Descriptor	Example Detail Description
1	Insignificant	No illness will result as asbestos is stable, therefore there is little likelihood of inhaling fibres above normal ambient levels.
2-3	Minor	Local fibre release only and in amounts and fibre size that are unlikely to cause latent asbestos related illness
4-6	Moderate	Asbestos may be unstable and could release fibres in the amount and size that may cause latent asbestos related illness
7-8	Major	Asbestos is unstable and will release fibres in the amount and size that will cause latent asbestos related illness
9	Catastrophic	Asbestos is highly friable and unstable, fibres will be released in size range and amount that are highly likely to cause latent asbestos related illness

Likelihood of Exposure

Rating	Descriptor	Description
9	Almost Certain	Is expected to occur in most circumstances – i.e. people regularly in the vicinity.
7-8	Likely	Will probably occur in most circumstances.
4-6	Possible	Might occur at some time.
2-3	Unlikely	Could possibly occur at some time but is unlikely.
1	Rare	May occur only in exceptional circumstances.

Risk Calculator

	Consequence or Impact				
Likelihood	9	7-8	4-6	2-3	1
9					
7-8					
4-6				Medium	Low
2-3			Medium	Low	Low
1			Medium	Low	Low

Risk **Priority with recommended action**

Extreme **P1** – Restrict access and isolate material immediately. Plan for removal as soon as practicable (less than 1 month). The identified material presents an immediate occupational/environmental risk in its present condition.

High **P2** – Limit access as an interim measure and identify for planned removal (less than 3 months). The identified material presents a potential occupational/environmental risk in its present condition.

Medium **P3** – Identify for removal where maintenance or refurbishment may cause disturbance of the material. Treat material (make safe, seal) to prevent potential fibre release as an interim measure.

Low **P4** – Leave in situ and reassess condition on at least an annual basis as required by current OHS&W Regulations. Consider removal when maintenance or refurbishment may cause disturbance of the material. The identified material presents a low occupational/environmental risk in its present condition unless acted upon

8 REFERENCE

ACT	Work Safety Act 2008 Work Safety Regulation 2009
NSW	Occupational Health and Safety Act 2000 Occupational Health and Safety Regulation 2001 Div 4
NT	Workplace Health and Safety Act Workplace Health and Safety Regulations Pt 12 Div 2
QLD	Workplace Health and Safety Act 1995 Workplace Health and Safety Regulation 2008
SA	Occupational Health, Safety and Welfare (SafeWork SA) Amendment Act 2005 Occupational Health, Safety and Welfare Regulations 2010
TAS	Workplace Health and Safety Act 1995 Workplace Health and Safety Regulations 1998 Div 9
VIC	Occupational Health and Safety Act 2004 Occupational Health and Safety Regulations 2007 Div 5
WA	Occupational Safety and Health Act 1984

Asbestos Code of Practice for the Management of Asbestos in the Workplace [NOHSC: 2018 (2005)]

Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC: 2002 (2005)]

Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)]

STATE AND TERRITORY WORK HEALTH AND SAFETY AUTHORITIES;

ACT	**Website**: www.worksafety.act.gov.au **Email**: worksafety@act.gov.au **Telephone**: (02) 6205 0333
NSW	**Website**: www.workcover.nsw.gov.au **Telephone**: 13 10 50
NT	**Website**: www.worksafe.nt.gov.au **Email**: ntworksafe@nt.gov.au **Telephone**: 1800 019 115
QLD	**Website**: www.worksafe.qld.gov.au **Telephone**: 1300 369 915 or (07) 3225 2000
SA	**Website**: www.safework.sa.gov.au **Telephone**: 1300 365 255
TAS	**Website**: www.workcover.tas.gov.au **Email**: wstinfo@justice.tas.gov.au **Telephone**: 1300 366 322 (inside Tasmania) or (03) 6233 7657 (outside Tasmania)
VIC	**Website**: www.workcover.vic.gov.au **Email**: info@worksafe.vic.gov.au **Telephone**: 1800 136 089 or (03) 9641 1444
WA	**Website**: www.worksafe.wa.gov.au **Telephone**: 1300 307 877 Part of the WA Department of Commerce

Appendix A – ASBESTOS REGISTER

Carters
Asbestos Management

REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

BUILDING – BUREAU OF METEOROLOGY

ANNUAL UPDATE INSPECTION SPECIFIC NOTES –

2012 Audit Notes

A copy of the site register was not located on site. However a copy of the 2011 register was provided at the request of Mr. Kevin Godfrey at the time of audit.
During this audit, additional consultancy and sampling was conducted to the Tower bituminous waterproof floor covering as requested.

2011 Audit Notes

The 2011 register has been reformatted into a Carter Corporation Photographic register format.
This audit was based upon conducting a re-inspection of the items listed within the Carter Corporation Annual update of 2010.

ORIGINAL REGISTER INSPECTION NOTES -

The original register inspection noted the following:

The update dated April 1998 was the only documentation provided for the preparation of the 2005 update. The 2005 update was not prepared with reference to the original register dated January 1995 by Asset Services.

Note sample analysis results or the extents of installed items are not recorded in the 1998 update. Recommend that over time the asbestos register is backed up by sample analysis for register items, potentially with a view to eliminating or verifying items. Recommend that the client acquire a copy of the original Asset Services register (1995)

Carters
Asbestos Management

REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

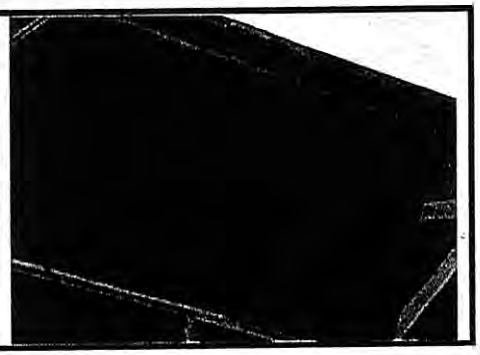
DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
A. Building external eaves lining (facing north east, level 3) – fibre cement sheet set on a 45 degree angle.	Approx 24m² Limited access	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

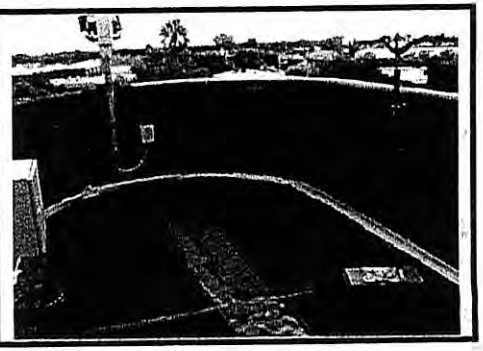
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Good Sealed Non friable	Sample 01/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Note the tower containing the A/C duct appeared to have a new rubber membrane coating to the tower surface. The presence of asbestos membrane at this tower could not be verified.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B1. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Poor Unsealed Non friable	Sample 01/GS/270412.	Not required

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

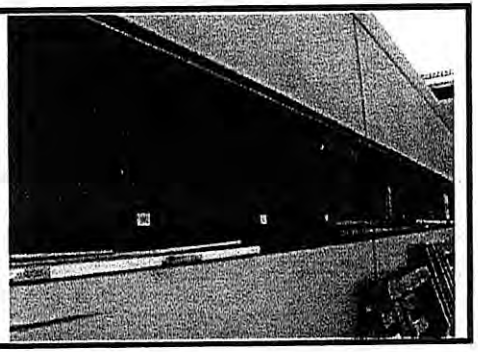
High Risk P2 – Restrict access. Dust residue and debris visible on roof from high traffic use. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Asbestos Approved Code of Practice". Recommend implement a safe access system to prevent further abrasion damage to the surface



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
C. Building external window panels to level 1 store room. Access the lane through the plant room level one to see external surfaces – fibre cement sheet.	Approx 15 No. panels approx. 8 m² visible Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

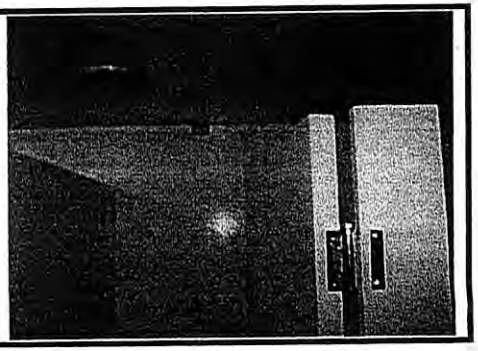
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x3) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
1. Building internal level 3 male / female toilets – partition walls, fibre cement sheet.	Approx 12^{m2} Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

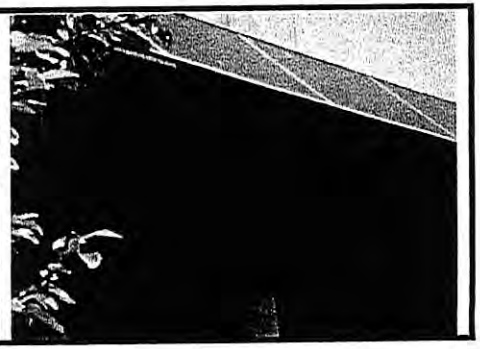
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
1a. Building internal level 3 above lobby on angled section continuation of item A. Eaves lining fibre cement sheet set on a 45 degree angle.	Approx 15m Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

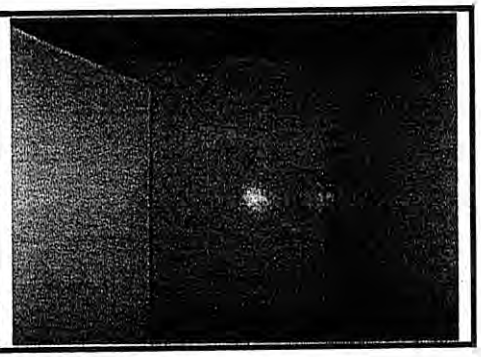
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
2. Building internal level 3 male / female toilets divider wall and duct cover in ladies toilet. Extent to include a small section of sheeting installed in ceiling above the male WC, with a hole cut out.	Approx 7m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

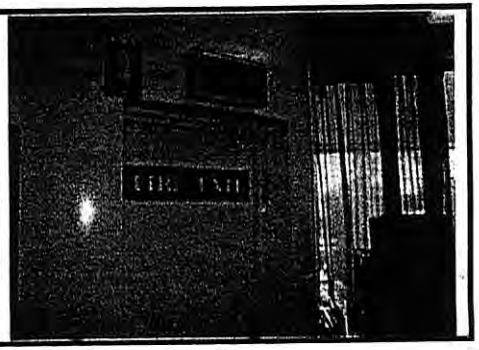
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
4. Building internal level 3 fire doors, internal core – compressed fibre insulation. Fire doors on this floor appear to be to the stair wells and a small cleaner's cupboard door in ladies toilet.	3 No. Approx 2m^2 Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

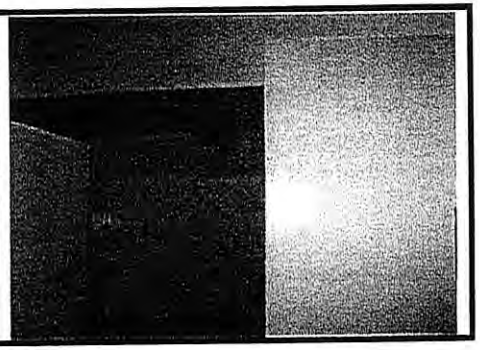
Low Risk P4 – Treat all fire doors as having an asbestos internal core unless confirmed otherwise by sample analysis.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
5. Building internal level 2 male / female toilets – partition walls, fibre cement sheet.	Approx 12m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

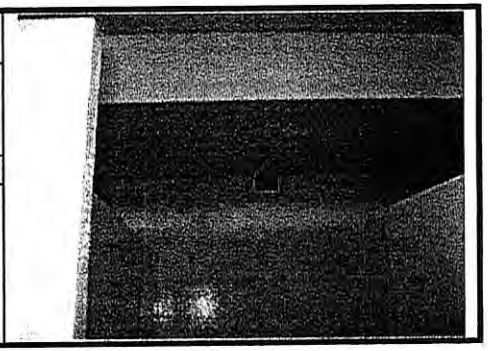
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
6. Building internal level 2 male / female toilets divider wall and duct cover in ladies toilet. Extent to include a small section of sheeting installed in ceiling above the male WC, with a hole cut out.	Approx 7m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

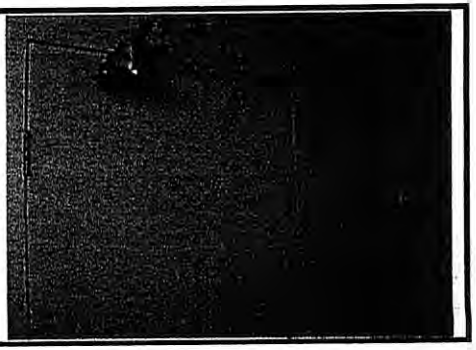
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
7. Building internal level 2 fire doors, internal core – compressed fibre insulation. Fire doors on this floor appear to be to the stair wells and a small cleaner's cupboard door in ladies toilet.	3 No. Approx 2m^2 Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

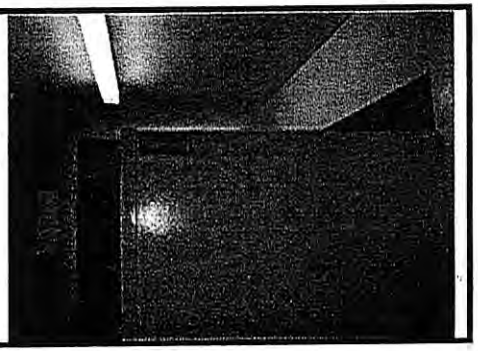
Low Risk P4 – Treat all fire doors as having an asbestos internal core unless confirmed otherwise by sample analysis.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
8. Building internal level 1 male / female toilets – partition walls, fibre cement sheet.	Approx 12m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

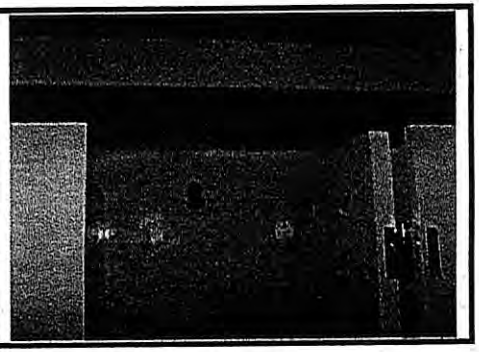
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
9. Building internal level 1 male / female toilets divider wall and duct cover in ladies toilet. Extent to include a small section of sheeting installed in ceiling above the male WC, with a hole cut out.	Approx 7m^2 Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

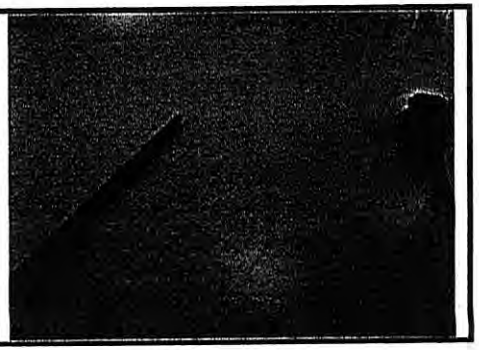
Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
10. Building internal level 1 floor covering all areas – vinyl tiles (cream brown with mustard coloured stripes).	Approx 120m^2 visible	Presume asbestos content	Stable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

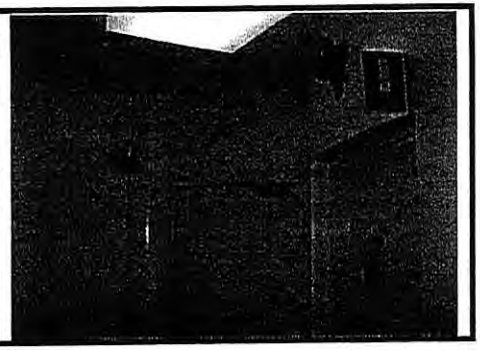
Low Risk P4 –Advised by staff; tiles may be concealed below carpeted and new vinyl sheet areas. Access these areas with caution when maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
May 2008. - Area east of lifts not accessed.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
11. Building internal level 1 fire doors, internal core – compressed fibre insulation. Fire doors on this floor appear to be to the stair wells and a small cleaner's cupboard door in ladies toilet.	12 No. Approx 2m^2 Inaccessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

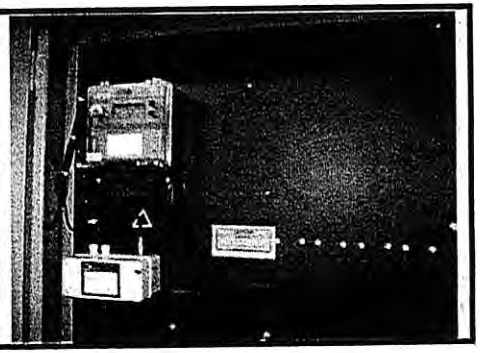
Low Risk P4 – Treat all fire doors as having an asbestos internal core unless confirmed otherwise by sample analysis.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
12. Building internal level 1 emergency generator room electrical board – black resin board.	Approx 0.8m² Accessible	Chrysotile asbestos (typical)	Good Unsealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

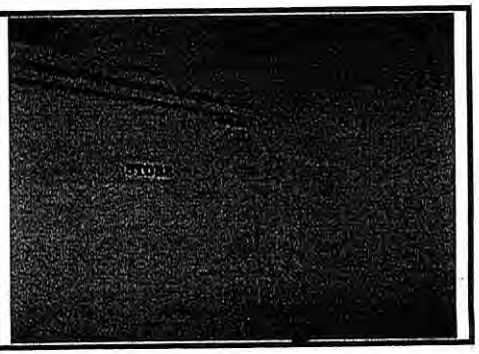
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
May 2010. - Dust residue and debris visible in base of electrical cabinet. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Approved Code of Practice".



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
13. Building internal level 1 panel above fire doors – fibre cement sheet	3 No. Approx 1m² Accessible	Presume asbestos content	Good Sealed Non friable	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

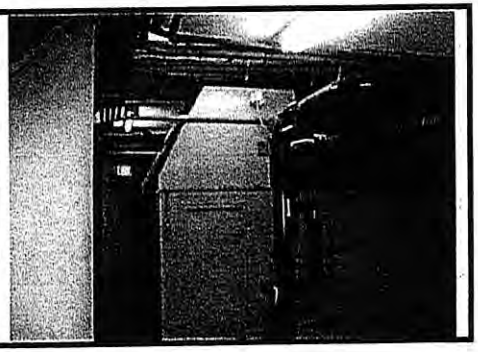
Low Risk P4 – Low Risk P4 – Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing. Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Total access to the roof area was not gained, as safe access was not available. This asbestos product is inherently hard and brittle. Treat all asbestos roof areas as fragile. Access with caution. Use safe access systems.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
14. Building internal level 1 plant room, Level 1, mastic on air conditioning duct joints.	Not quantified Inaccessible	Presume asbestos content	Building internal level 1	Visual	Not visible Covered by general sign on a/c plant.

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

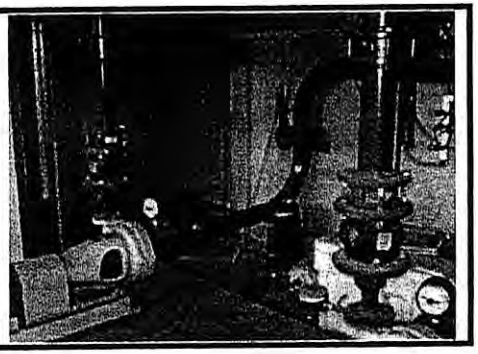
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
15. Building internal level 1 plant room, Level 1, insulated pipe jackets above two centrifugal pumps, number 1 and number 2.	Not quantified Inaccessible	Presume asbestos content	Building internal level 1	Visual	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
17. Building internal level 1 telephone cable riser fire retardant sealer.	Not quantified Inaccessible	No asbestos detected	Not assessed	Sample 03/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

No asbestos detected upon laboratory analysis of sample.

No Photograph

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
18. Sludge and debris washed down vents in toilets from roof damage.	Not quantified Inaccessible	No asbestos detected	Not assessed	Sample 02/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

No asbestos detected upon laboratory analysis of sample.

No Photograph

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL ID	SIGNAGE STATUS	
[illegible]	[illegible]	[illegible]				No Photograph
SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS						
New low visible [illegible]						

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL ID	SIGNAGE STATUS	
[illegible]	[illegible]	[illegible]				No Photograph
SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS						
No asbestos [illegible]						

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL ID	SIGNAGE STATUS	
[illegible]						No Photograph
SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS						
No asbestos visible [illegible]						

Appendix B – CERTIFICATES OF ANALYSIS

Samples submitted for laboratory analysis are analysed in accordance with NATA approved methods for analysis. Certificates of analysis are provided by the laboratory as a reference of the results for inclusion into the register.

Samples as received in our offices (taken by others) are analysed in accordance with NATA approved methods for analysis, No responsibility is taken for the actual sampling collection technique, determination of sample location, and the consequent bearing on the sample result.

- **Limitations of Sample Analysis**

The certificate of analysis provided by the laboratory is a record of asbestos or non-asbestos content of the sample piece provided for analysis.

Generally sample size is approximately 30mm square for a non-friable material where the material is accessible to sample. Consideration is given to minimise damage to clients property where taking necessary samples as it is difficult to remove a sample from installed materials such as flushed fixed panel wall, ceiling linings and fixed floor coverings. In other cases it may not be safe to access materials to take samples such as electrical panels, and integral gasket / seal or insulation materials to plant and equipment.

- **Inconclusive Sample Identification**

In some instances it is not possible to determine asbestos fibre content within a sample using the NATA approved method (PLM – polarized light microscopy). Items such as vinyl floor products, adhesives and mastics due to low asbestos content and/or non uniform asbestos fibre concentration are often difficult to analyse. Due to the nature of these materials the NATA laboratory has recommended that the material be tested using another independent technique (XRD – x-ray diffraction), where PLM and XRD analysis have been made two certificates of analysis will be supplied.
XRD can determine what group of minerals are present in the sample i.e. Serpentine and or Amphibole however the test does not specify what type of asbestos fibre is present. The result may show a sample for example from the Amphibole group but this does not confirm the mineral is actually an asbestos fibre; however the material is presumed to contain asbestos and will be treated as asbestos.

- **Representative Sample Analysis**

Asbestos content can vary within a material dependant upon factors such as installation procedures, differences in stocks and supplies, time differences in stages of construction and physical mixing of varying quantities of asbestos with other materials. Sections of asbestos containing materials may have also been replaced with non-asbestos materials that look identical from inspection (eg damaged eaves or wall cladding patched or repaired with non-asbestos). Inconsistencies in sample results may be possible due to the inspected materials within a property not being typical throughout. Carter Corporation accepts no responsibilities for the representativeness of the sample(s) presented for analysis.

ABN: 83 117 421 324
OCTIEF Pty Limited
1a/22 Ereton Drive, Arundel QLD 4214
Enquiries: 1300 138 366
Ph: (07) 5537 2536
Fax: (07) 5537 2535
corporate@octief.com.au
www.octief.com.au

Issue Date: 03/05/2012 **Job #:** BSQ111476.1

Certificate of Analysis
Laboratory Report

Client:	Carter Corporation	**Sampled By:**	GS
Client Contact:	Andrea Reeve	**# of Samples Submitted:**	3
Telephone:	(08) 8346 2999	**Sampling Date:**	27/04/2012
Email:	areeve@cartercorporation.com.au	**Date Received:**	01/05/2012
Project:	AS1979 E4570	**Identification Date:**	02/05/2012

Scope: Microscope examination for the presence of asbestos

Methodology: Samples are examined in accordance with the methodology outlined in the Australian Standards (AS4964-2004) and In-House Procedure QP-930-001

NATA Approved Identifier: Tim Trembath ..... **Report Approved By:** Jay Spencer .....

This report supersedes report BSQ111476.0

Acronyms

Asbestos Fibre Types

CH	*Chrysotile (White Asbestos) fibres detected*
A	*Amosite (Brown / Grey Asbestos) fibres detected*
C	*Crocidolite (Blue Asbestos) fibres detected*
-	*No asbestos fibres detected*

Non-Asbestos Fibre Types

ORG	*Organic fibres detected*
SMF	*Synthetic mineral fibres detected*
UMF	*Unidentified mineral fibres detected*
-	*No non-asbestos fibres detected*

SCOPE OF ACCREDITATION: Class 7.82.31: Qualitative identification of asbestos types in bulk samples by polarised light microscopy

This document is issued in accordance with NATA's accreditation requirements
Accredited for compliance with ISO/IEC 17025
NATA accreditation number: 15172
This document may not be reproduced except in full

Carters
Asbestos Management
ADDRESS: 25 College Road, Kent Town SA
REGISTER: AS 1970
DATE: 27/04/2012
NEXT AUDIT DUE: 04/2013

ABN: 83 117 421 324
OCTIEF Pty Limited
1a/22 Ereton Drive, Arundel QLD 4214
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www.octief.com.au

Carters
Asbestos Management

REGISTER: AS 1970
ADDRESS: 25 College Road, Kent Town SA
DATE: 27/04/2012
NEXT AUDIT DUE: 04/2013

Issue Date: 03/05/2012

Job #: BSQ111476.1

Table 1 - Results of sample examination using polarised light microscopy (PLM) including dispersion staining

Sample Identification Number	Sample Location	Sample Description	Approximate Size or Weight	Asbestos Detected (Yes/No)	Asbestos Fibre Types Detected	Non-Asbestos Fibre Types Detected
01/GS/270412	North tower - Item B - Membrane and debris	Black bituminous material	40 x 32 x 4mm	Yes	CH	ORG
02/GS/270412	Debris washed down vent level 3 toilets	Sludge	44 x 29 x 3mm	No	-	ORG
03/GS/270412	Sealer from cable risers level 2 and 1	Beige coloured sealer	85 x 64 x 28mm	No	-	-

Detection Notes
N/A

SCOPE OF ACCREDITATION: Class 7.82.31: Qualitative identification of asbestos types in bulk samples by polarized light microscopy

NATA
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Appendix C – REGISTER DRAWING

LEGEND: **This drawing is indicative only, not to scale and is to be read in conjunction with register.**

X = designates ceiling access point

(A.) = letters indicate location of external asbestos containing materials, refer to asbestos register location schedule

(1.) = no.'s indicate location of internal asbestos containing materials, refer to asbestos register location schedule

Carters
Asbestos Management

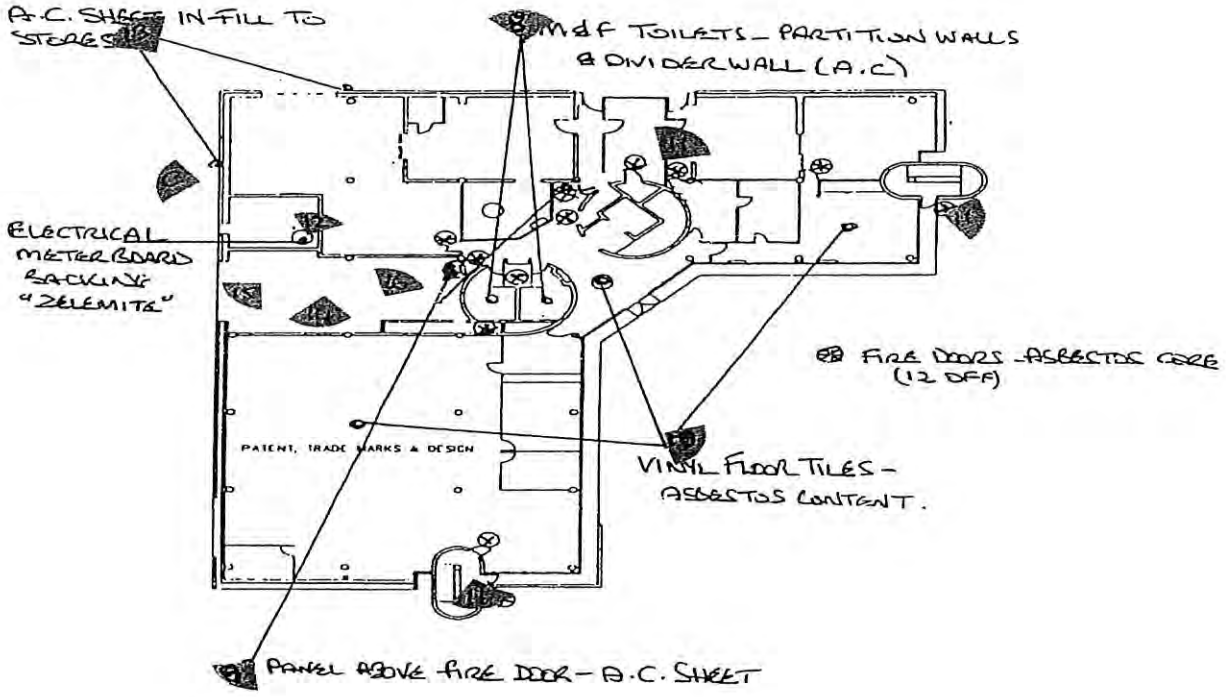
REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

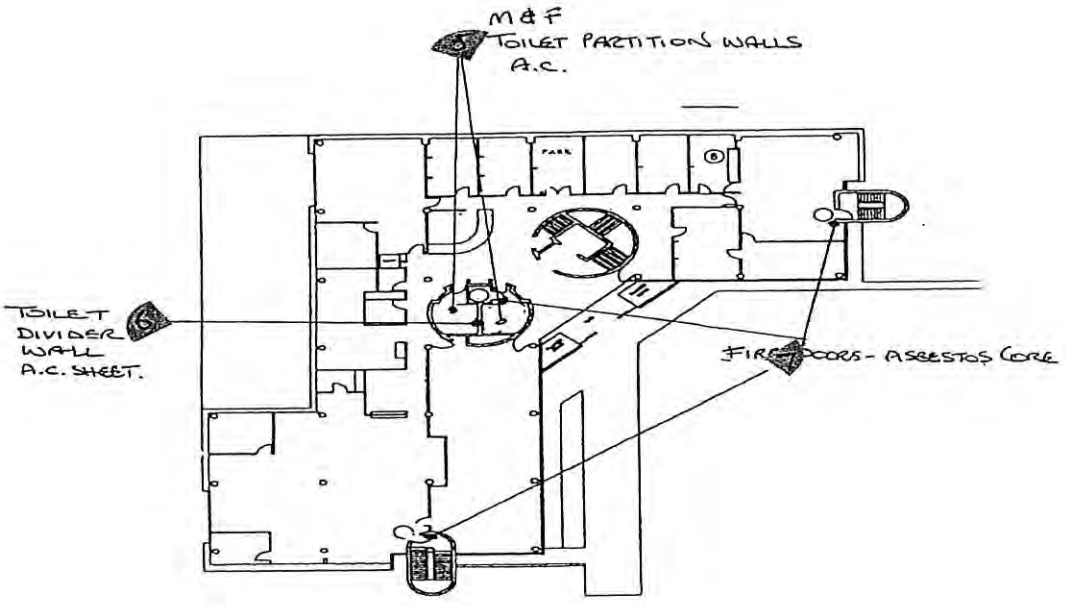
DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

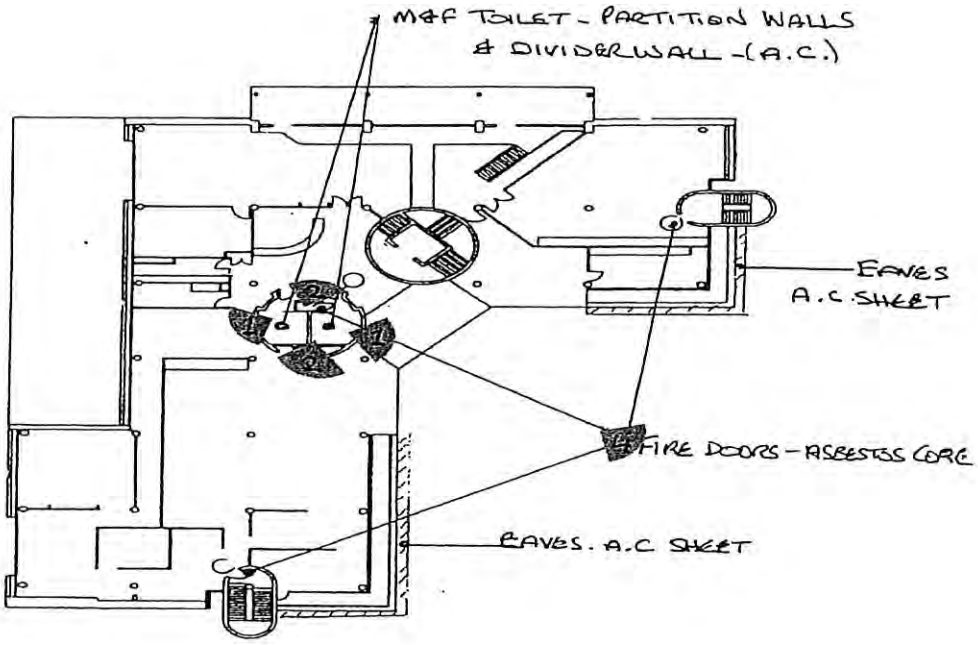
LEVEL 1



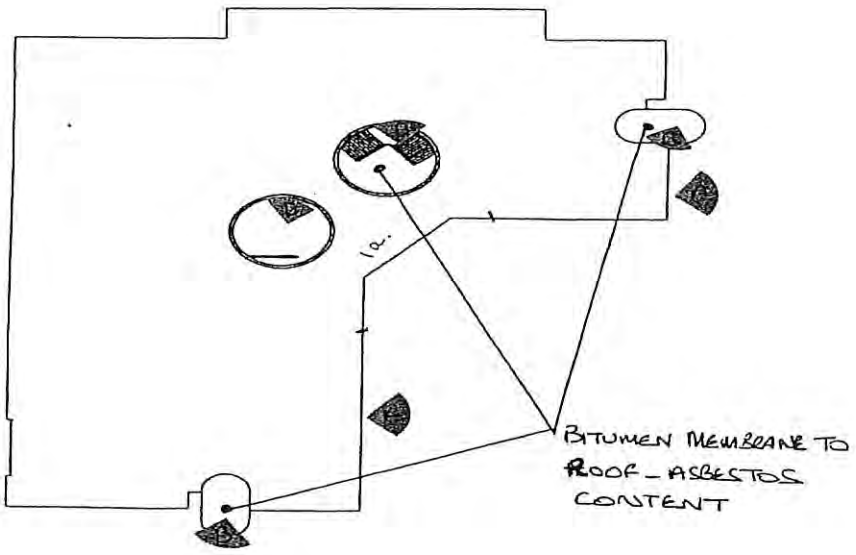
LEVEL 2



LEVEL 3



LEVEL 4



Appendix D – FORMS

Carters
Asbestos Management

REGISTER: AS 1970

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

1. RECORD OF REMOVALS, MAINTENANCE AND OTHER ASBESTOS RELATED WORKS

Date;	**Government Approval No.;**	
Description of Work; including register item number, location and type of asbestos		
Contractor;	**Supervisor;**	
Managing Consultant;	**Air Monitoring Consultant;**	
Accidental Exposure	**No** ☐ **Yes** ☐	RECORD OF SUSPECTED EXPOSURE TO RESPIRABLE ASBESTOS FIBRES FORM TO BE COMPLETED IF YES
Supporting Documentation Supplied		
☐ **SWMS**	☐ **Government Approval**	☐ **Air monitoring Report** ☐ **Certificate of Inspection**

Date;	**Government Approval No.;**	
Description of Work; including register item number, location and type of asbestos		
Contractor;	**Supervisor;**	
Managing Consultant;	**Air Monitoring Consultant;**	
Accidental Exposure	**No** ☐ **Yes** ☐	RECORD OF SUSPECTED EXPOSURE TO RESPIRABLE ASBESTOS FIBRES FORM TO BE COMPLETED IF YES
Supporting Documentation Supplied		
☐ **SWMS**	☐ **Government Approval**	☐ **Air monitoring Report** ☐ **Certificate of Inspection**

2. RECORD OF SUSPECTED EXPOSURE TO RESPIRABLE ASBESTOS FIBRES

A copy of this form must be given to the employee and the original kept in their personal file for 40 years.

- **Employee to Complete:**

Personal Details

Name: _____ Date of Birth: ----------

Address: _____ Department: ----------

Job Title: _____

I believe I may have been exposed to respirable asbestos fibres, the details being as follows:

Name of Address/Establishment where suspected exposure occurred:

Name: _____

Address: _____

Time:

Date (s) of suspected exposure;
Time (s) / duration of suspected exposure;

Location of suspected asbestos:

Asbestos Register No. AS
Precise Location:
Specify Use, if known:
Asbestos Accidentally Damaged/Disturbed by you:
Type of work that damaged asbestos:
Equipment being used:

Signature of Employee: _____

- **Supervisor to Complete:**

Follow-up action required: _____

_____

_____

_____

_____

_____

Name of supervisor: _____

Signature of supervisor: _____

Adelaide Asbestos Audits and Monitoring

AIRBORNE ASBESTOS FIBRE MONITORING

Site: Bureau of Meteorology 25 College Road Kent Town

Client: Carter Corporation **Date:** 12-12-2012

Job Name: CART01-121212-MS **Approval:** n/a **LRN:** 12-000353

Location	Activity	Time On	Run Time	Flow Rate (ml/min)	Fibres Conc. (per mL)
Northern tower stairwell	G	0822	135	3000	<0.01
Northern tower roof	G	0822	135	3000	<0.01

G = Background C= Clearance F = Final Clearance B= Waste Removal
S = Plastic Stripdown

The Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Source D Update) 2003 [NOHSC:1003(1995)] requires a Fibre Concentration of no more then 0.1 fibres per mL

Analyst: Mark Seater

49 Heath Street Birkenhead 5015
Tel: 040 040 1972 Fax: +61 8 8242 4969

Procedure: AAAM - 01

Carters
Asbestos Management

REGISTER: AS 1978

ADDRESS: 25 College Road, Kent Town SA

DATE: 27/04/2012

NEXT AUDIT DUE: 04/2013

LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
A. Building external eaves lining (facing north east, level 3) – fibre cement sheet set on a 45 degree angle.	Approx 24m^2 Limited access	Presume asbestos content	Good Sealed Non friable	Visual	Not visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

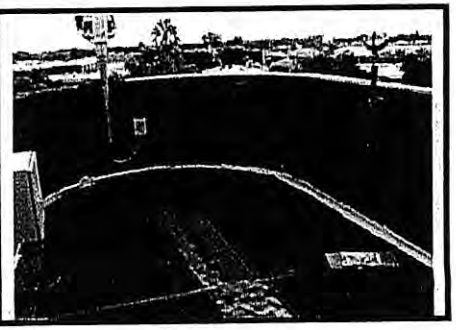
Low Risk P4 – Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Unable to affix specific warning sign to item, covered by General sign affixed on a/c plant.
Recommend sample (x1) to qualify material content, otherwise treat item as asbestos containing.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Good Sealed Non friable	Sample 01/GS/270412.	Visible

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

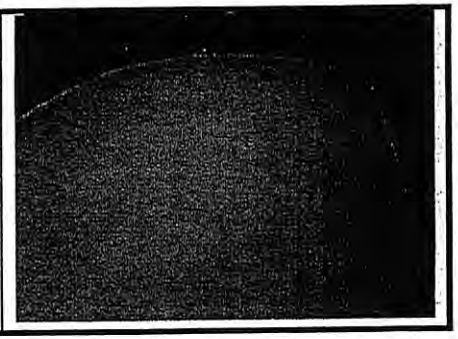
Low Risk P4 –Avoid physical and mechanical damage. When maintenance/upgrade is required, recommend removal and reinstate with non-asbestos product.
Note the tower containing the A/C duct appeared to have a new rubber membrane coating to the tower surface. The presence of asbestos membrane at this tower could not be verified.



LOCATION - DESCRIPTION	EXTENT	ASBESTOS ASSESSMENT	CONDITION	SAMPLE NO VISUAL TEST	SIGNAGE STATUS
B1. Building external roof membrane to level 4 towers. Membrane to the towers above the stair wells and the observation and A/C duct/services towers	Not quantified Limited access	Chrysotile asbestos detected	Poor Unsealed Non friable	Sample 01/GS/270412.	Not required

SURVEY FINDINGS and HAZARD MANAGEMENT RECOMMENDATIONS

December 2012 – Asbestos Maintenance Works completed on the North Tower where access had been restricted per management plan adopted from April 2012 update. North tower has been made safe / vacuumed dust / debris and wet wiped floor area under monitored conditions, before applying a paint base coat to seal the membrane floor area only. Refer to certificate of completion form and air-monitoring clearance report 13/12/12, emailed to building owner for inclusion into the register.
April 2012 - High Risk P2 Restrict access. Dust residue and debris visible on roof from high traffic use. Recommend clean up immediately with approved asbestos vacuum system in accordance with "Asbestos Approved Code of Practice". Recommend implement a safe access system to prevent further abrasion damage to the surface.



Asbestos Audit update after new tower removal work

Carters
Asbestos Management

- **Asbestos Registers & Annual Updates**
- **Asbestos Repairs & Maintenance**
- **Asbestos Training & Support**
- **Asbestos Removal**
- **Asbestos Advice & Consultancy**
- Asbestos Safety Products

CERTIFICATE OF COMPLETION (MAINTENANCE)

DATE OF WORK	12/12/2012	REGISTER or JOB No.:	1979	ENQUIRY No.:	12219
PERSONS CARRYING OUT WORK	Willie Harris				
PROPERTY ADDRESS	Bureau of Meteorology, 25 College Road, Kent Town				
NAME OF CLIENT AUTHORIZING WORK TO PROCEED	Mr John Squarcini				

Work Carried Out *(Brief Scope)*

North tower make safe – vacuum, scrub / wet wipe surface of asbestos containing bituminous membrane floor covering of the under air monitored conditions.
Once all clear given, paint seal bituminous floor covering (base coat) 12/12/2012.
Apply second / final paint coat 13/12/2012

TICK	ITEM NO'S	DESCRIPTION OF WORK
☐		Item removed in accordance with "Approved Code of Practice".
☒	B	Dust and debris cleaned up using approved asbestos rated vacuum system in accordance with "Approved Code of Practice".
☐		Asbestos waste collected and disposed of in accordance with EPA requirements.
☒	B	Item made safe in accordance with "Approved Code of Practice".
☒	B	"All Clear" air monitoring certificate attached (where applicable).
☐		Caution signs installed in accordance with safe work method and SOP.
☐		Samples taken in accordance with safe work method and SOP.
☐		Other (SPECIFY)

Standard Operating Procedure Used / Safe Work Method

- ☐ SOP 3.2 **Removal of Asbestos Cement and Resin Boards**
- ☐ SOP 3.3 **Removal of Vinyl Tiles**
- ☒ SOP 3.5 **Vacuum Use**
- ☒ SOP 3.6 **Making Safe Asbestos Containing Materials**
- ☐ SOP 3.7 **Transport and Disposal of Waste**
- ☐ SOP 3.8 **Collection of Waste**
- ☐ SOP 3.9 **Installing Caution Signs**
- ☐ SOP 3.10 **Installing Register Holder**
- ☐ SOP 1.3 **Sample Taking**
- ☐ OTHER

Job Notes / Qualifications / Limitations of Removal *(if any - Use back of sheet for further notes if required)*

Signed : WGH **Date:** 13-12-2012

Carter Corporation Pty Ltd 42 Trembath Street Bowden SA 5007
P (08) 8346 2999 F (08) 8346 3888 E enquiries@cartercorporation.com.au W www.cartercorporation.com.au
ABN 58 007 881 763 Asbestos Lic 72803 EPA Lic 13933 AS4801 OH&S Accredited

Adelaide Asbestos Audits & Monitoring

REPORT OF ANALYSIS

Report Number:	**RN 01644**	**Client Order Number:**	AS1979e12219WH
Reference Code:	CART01-121212-MS	**Approval Number:**	n/a

Air monitoring in accordance with the National Occupational Health and Safety Commission guidance note on the membrane filter method for estimating airborne asbestos dust was carried out concluding on the **12-Dec-12**

at **Bureau of Meteorology 25 College Road Kent Town**

on behalf of **Carter Corporation**

The spreadsheets of results attached, indicate that during the monitoring sessions the areas tested were well below the Worksafe Australia Exposure Standard of 0.1 fibres /mL.

This report should not be considered as a contractual document and should not be reproduced except in full.

Mark Seater
Approved Analyst
12-Dec-12

Adelaide Asbestos Audits Monitoring
49 Heath Street, Birkenhead SA 5015
Mobile: 040 040 1972 Fax 08 8242 4969
E-mail: adelaideasbestos@bigpond.com.au

Adelaide Asbestos Audits and Monitoring

AIRBORNE ASBESTOS FIBRE MONITORING

Site: Bureau of Meteorology 25 College Road Kent Town

Client: Carter Corporation **Date:** 12-12-2012

Job Name: CART01-121212-MS **Approval:** n/a **LRN:** 12-000353

Location	Activity	Time On	Run Time	Flow Rate (ml/min)	Fibres Conc. (per mL)
Northern tower stairwell	G	0822	135	3000	<0.01
Northern tower roof	G	0822	135	3000	<0.01

G = Background C= Clearance F = Final Clearance B= Waste Removal
S = Plastic Stripdown

The Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment (Source D Update) 2003 [NOHSC:1003(1995)] requires a Fibre Concentration of no more then 0.1 fibres per mL

Analyst: Mark Seater

49 Heath Street Birkenhead 5015
Tel: 040 040 1972 Fax: +61 8 8242 4969

Procedure: AAAM - 01

10 May 2017

A.M. Environmental Consulting Pty Ltd
PO Box 119
Aldgate
SA 5154

Ashley@AMEnvironmental.com.au

Mr David Cargill
SCOPE Development Solutions
Level 5, 100 Pirie Street
Adelaide, South Australia 5000

Letter provided by email to: david@scopesolutions.com.au

Commentary on Preliminary Environmental Site History Assessment Report (Mott MacDonald, 2016)
25 College Road, Kent Town, South Australia

Dear Mr Cargill,

As requested, this letter pertains to environmental services provided by Mott MacDonald Australia Pty Ltd for 25 College Road, Kent Town, South Australia. I was the primary author and project director of this project and report when employed by Mott MacDonald, however I provide the below commentary in my capacity as Director of AME based on my understanding of the site and in order to expedite any concern over the 'draft' status of the associated document. (Noting that I am not in a position to comment on behalf of Mott MacDonald).

Mott MacDonald (29 April 2016) prepared a report titled '*Preliminary Environmental Site History Assessment 25 College Road, Kent Town, South Australia*' for the site. This was issued in draft format only and you now require a letter from the primary author, now employed by AME, to outline that there were no subsequent additions in terms of content and that the content interpretation remains as per the draft in terms of moving the project forward, in addition to a recommendation that the document be accepted as is, regardless of the draft watermark. As the primary author, I can confirm that the above is true and accurate.

If you require any further information, or if we can be of any assistance, please feel free to contact the undersigned at any time to discuss.

Kind regards,

Ashley Moule
Director

Attachments:
Important Information About This Letter

Important Information

AME has prepared this report based on generally accepted practices and standards in operation at the time that it was prepared. No other warranty is made as to the professional advice included in this report. All parties should satisfy themselves that the scope of work conducted and reported herein meets their specific needs before relying on this document.

AME believes that its opinions have been developed according to the professional standard of care for the environmental consulting profession at the date of this document. That standard of care may change as new methods and practices of exploration, testing, analysis and remediation develop in the future, which may produce different results.

Environmental conditions are created by natural processes and human activity, and as such may change over time e.g. groundwater levels may rise or fall, contamination may migrate and fill may be added to the site. This report therefore presents a point in time assessment of the site, and as such can only be valid for the time at which the investigation was undertaken.

Any investigation such as that contained in this report can examine only a fraction of the subsurface conditions at the site. There remains a risk that pockets of contamination or other hazards may not be identified as investigations are necessarily based on sampling at localised points. Certain indicators or evidence of hazardous substances or conditions may have been outside the portion of the subsurface investigated or monitored, and thus may not have been identified or their full significance appreciated. As such, the identified environmental conditions reported are only valid at the points of direct sampling and any derived or interpolated conditions may differ from these targeted locations and cannot be assumed to be indicative of the remainder of the site.

The methodology adopted and the sources of information used are outlined in this report. AME has limited its investigation to the scope agreed for this contract and it is possible that additional sampling and analysis could produce different results and/or opinions. AME has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions.

This assessment assumes that the proposed development meets requirements as outlined in the Building Code of Australia and Australian Standards. If these recommendations are not met, there is potential for the exposure and therefore risk to building users to be higher than that presented in this assessment.

The soil descriptions contained in this report have not been prepared for engineering design purposes and the reinstatement of any sampling locations were not conducted in accordance with any supervised filling or geotechnical standard. The term suitable has been used in the context of a request from the planning authority and means that the concentrations reported did not exceed the guideline concentrations adopted for the proposed land use/exposure pathway.

This report does not include the assessment or consideration of hazardous building materials, including asbestos. Such materials should be assessed and managed by a qualified and licensed assessor/contractor.

In general, the available scientific information pertaining to contamination is insufficient to provide a thorough understanding of all of the potential toxic properties of chemicals to which humans may be exposed. The majority of the toxicological knowledge of chemicals comes from experiments with laboratory animals, where there may be interspecies differences in chemical absorption, metabolism, excretion and toxic response. There may also be uncertainties concerning the relevance of animal studies using exposure routes that differ from human exposure routes. In addition, the frequent necessity to extrapolate results of short-term or subchronic animal studies to humans exposed over a lifetime has inherent uncertainty. Therefore, in order to conduct an environmental assessment, it is necessary to take into account these inherent uncertainties and extrapolate information from the data that is available, considered current and endorsed as acceptable for the assessment of risks to human health. There is therefore inherent uncertainty in the process, and to compensate for uncertainty, conservative assumptions are often made that result in an overestimation rather than an underestimation of risk.

All advice, opinions or recommendations contained in this document should be read and relied upon only in the context of the document as a whole. This report does not purport to give legal advice as this can only be given by qualified legal practitioners. This document does not represent a Site Contamination Audit Report.

pruszinski architects
172 pulteney street, adelaide 5000 / 08 82233123 / www.prusarch.com.au

WASTE MANAGEMENT STATEMENT – 25 College Road, Kent Town

The proposed development at 25 College Road Kent Town is a mixed residential development situated on land between the south side of College Road and north side of Little Young Street. The use mix consists of a multi storey residential building with approximately 70 Apartments and a series of 8 two storey Town Houses along College Road Using the Design Guide for Residential Recycling appendix 2: Waste Resource Generation Rates, produced by the Adelaide City Council, the following waste management solutions are provided.

Table 1: Calculations of average waste generation is based on the following information:
70 Apartments/Households (13x 1 Bed Apts & 57x 2 Bed Apts = 127 Beds total) – Type B – Medium/High Density
8 Townhouses – Type A – Low Density

Floor	Land Use	WASTE (excluding food)	CO-MINGLED RECYCLING	GREEN ORGANICS (including food)
Townhouses College Road	**Town Houses** (low density dwellings) **Total Week:**	Red – 140L MB / dwelling 8 Red Bins	Yellow – 240L MB / dwelling 8 Yellow Bins	Green – 240L MB / dwelling 8 Green Bins
Building 1 Residential 19 Apartments 33 Beds	**Apartments** (high density dwellings) **Total Day:** **Total Week:** eWaste Component **Total Week:**	30 litres / bed / week **142 litres / day** **990 litres / week** 0.77m³ / household / year **15m³ / year**	20 litres / bed / week **94 litres / day** **660 litres / week**	10 litres / bed / week **48 litres / day** **330 litres / week**
Building 2 Residential 26 Apartments 46 Beds	**Apartments** (high density dwellings) **Total Day:** **Total Week:** eWaste Component **Total Week:**	30 litres / bed / week **198 litres / day** **1380 litres / week** 0.77m³ / household / year **20m³ / year**	20 litres / bed / week **132 litres / day** **920 litres / week**	10 litres / bed / week **66 litres / day** **460 litres / week**
Building 3 Residential 25 Apartments 48 Beds	**Apartments** (high density dwellings) **Total Day:** **Total Week:** eWaste Component **Total Week:**	30 litres / bed / week **206 litres / day** **1440 litres / week** 0.77m³ / household / year **20m³ / year**	20 litres / bed / week **138 litres / day** **960 litres / week**	10 litres / bed / week **69 litres / day** **480 litres / week**
Total Residential Apartments	**Total Day:** **Total Week:** eWaste Component **Total Week:**	**545 litres / day** **3810 litres / week** 0.77m³ / household / year **55m³ / year**	**363 litres / day** **2540 litres / week**	**182 litres / day** **1270 litres / week**

General Waste, Co-Mingled Recycling and Green Organics for Town Houses are stored at each dwelling and operate as per standard suburban housing.

General Waste and Co-Mingled Recycling are transported down onto the ground floor waste room of each building via separate bin chutes from the residential floors. Waste chutes reduce the requirement to take waste into the passenger lifts. Green organics are moved manually into their respective ground floor storage areas by users at which point Facilities Maintenance will move bins to ground floor storage that are collected weekly by council or contractor.

The information gathered from table 1 indicates the need for the following requirements for waste bins in the complex. 660L MGB's are used for their capacity, ease of manoeuvrability, speed of pick-up and minimal size of waste truck required (better for manoeuvrability and on site height restriction of 3300mm refer traffic engineers report).

660L General Waste Bin (blue):	8 Bins provide 9 days of service
660L Recyclable Materials (yellow):	6 Bins provide 10 days of service
660L Organic Waste (green):	3 Bins provide 10 days of service

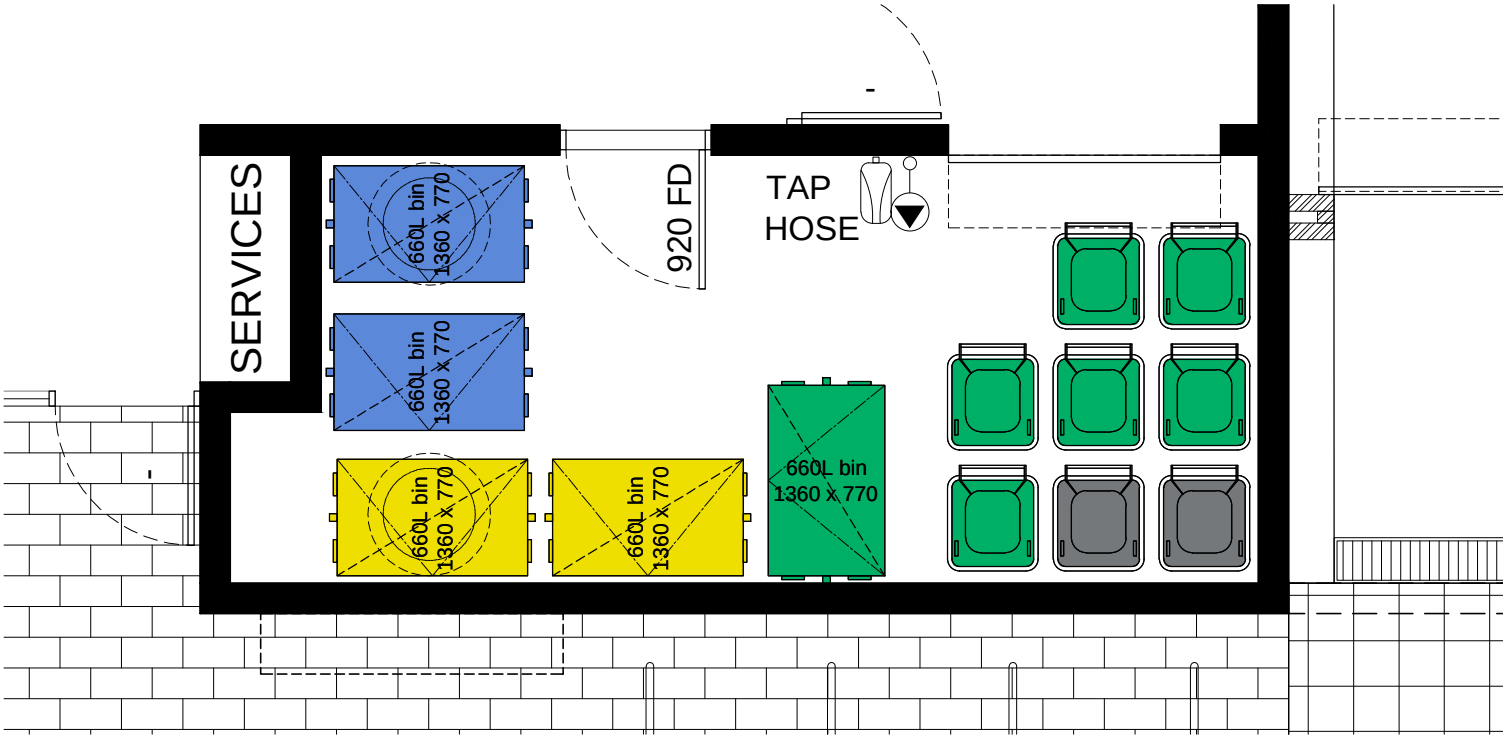
An additional allowance has been made for green waste associated with maintenance of the level 1 community areas. This allowance is provided with additional 240L MGB's for ease of manual handling around the gardens and communal space.
S:\Pruszinski Architects\College Road 25 - Kent Town\Project Admin\Waste Management Statement\

240L MGB Organic Waste (green):	6 Bins (min)

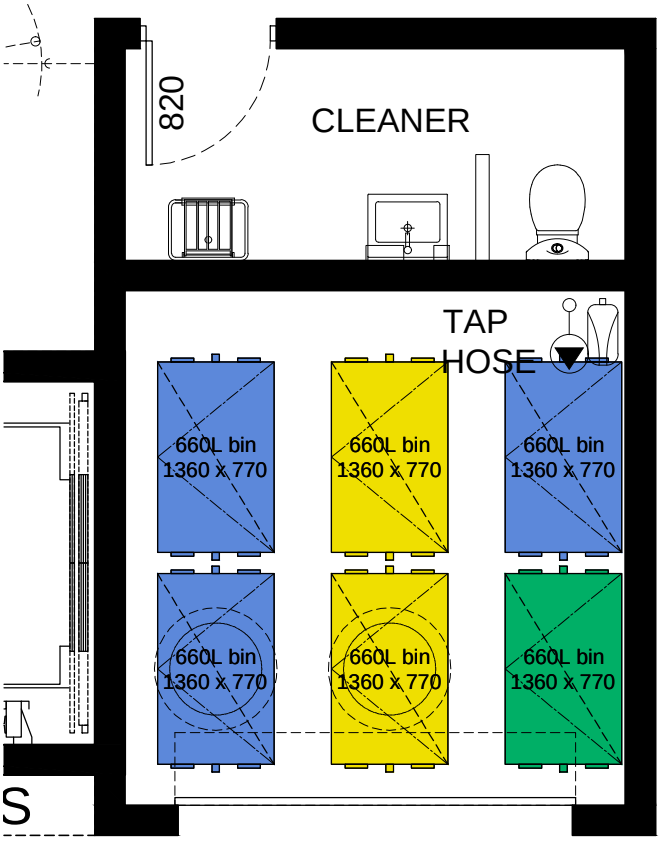
A waste removal company will be contracted by the Tenancy Strata Corporation to manage waste and empty bins from the ground floor, in accordance with the frequency outlined in this report.

We expect the tenancy strata to remove all waste types from the building once a week as required and swap full bins for empty bins under each chute as required (every 3 days). Waste is expected to be collected during the day at a similar time to local council collection in the area.

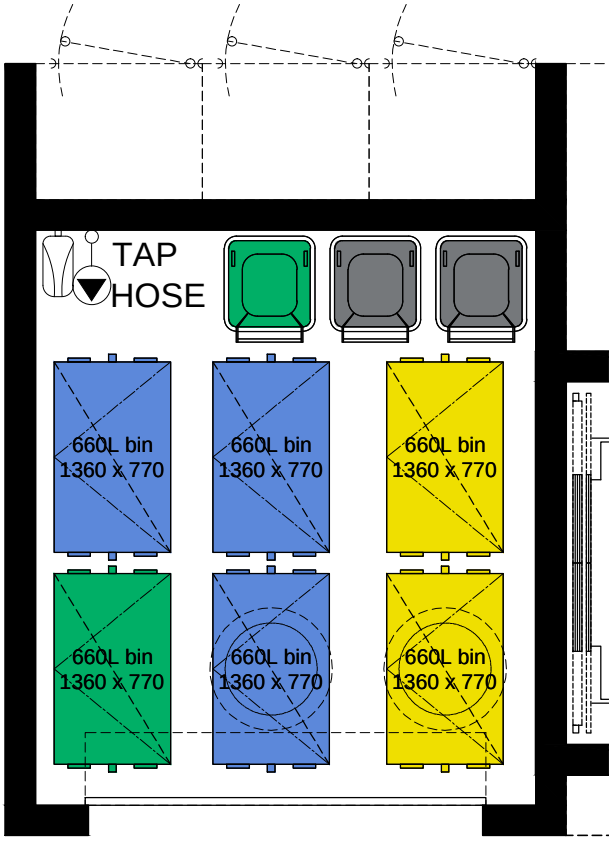
The ground floor storage rooms have adequate capacity for the buildings load requirements.



REFUSE ROOM BUILDING 1
SCALE 1:50



REFUSE ROOM BUILDING 2
SCALE 1:50



REFUSE ROOM BUILDING 3
SCALE 1:50

25 College Road
Kent Town

Landscape Concept Report_Revision 4

April 2017
Project No.: 16037

ASPECT Studios™

Contents

Concept Design **3**

Landscape Master Plan

Landscape Precedents: Key Spaces

Sections

Design Palette **7**

Indicative Material Palette

Indicative Planting Palette

Concept Design

Landscape Master Plan

LEGEND

- Shareway
- Arbour
- Recycled red brick feature pave
- Timber decking
- Entry stairs
- Outside seating
- Private courtyard
- Feature tree
- Evergreen tree
- Site Boundary



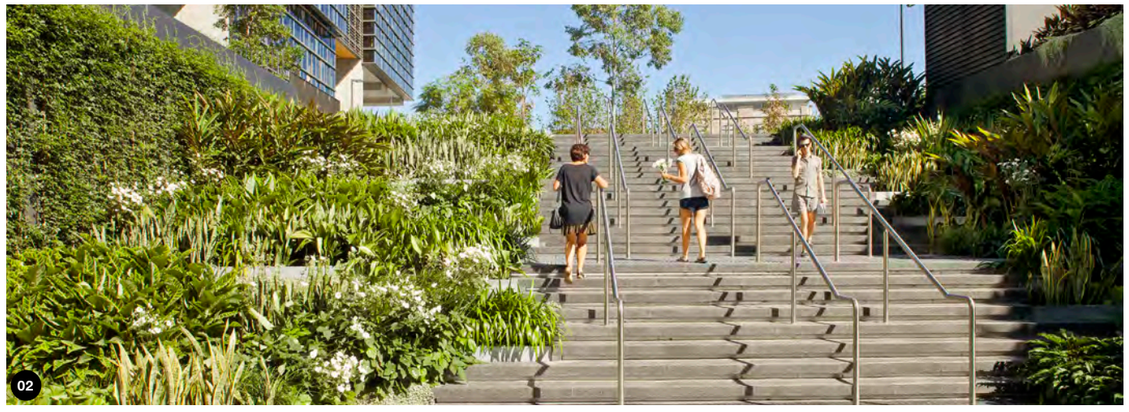
Scale: **1:300@A3**

Landscape Precedents: Key Spaces

1. Shared street with adjacent feature tree planting and seating.
2. Planting up stairs and possibility to include cables for creepers to grow up the building facade.
3. Intimate seating nooks with adjacent planting
4. Timber arbor with picnic settings beneath. Opportunity to integrate the arbor into the fence system.
5. Raised concrete planters with timber seating and feature trees
6. Planting to the fence line for privacy
7. Internal courtyards with integrated seating and screening plants
8. Larger arbor with permeable roof structure
9. Bike parking

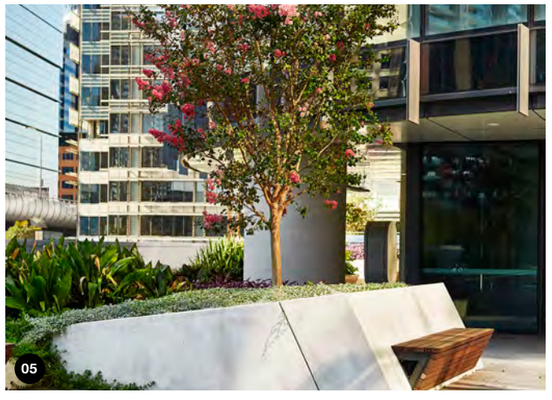
Refer to Landscape Master Plan for key number locations


01


02

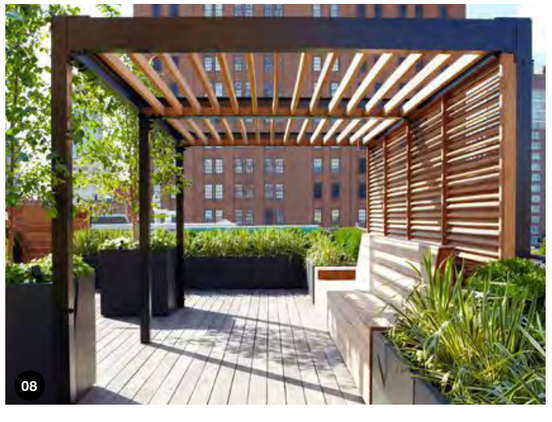

03


04

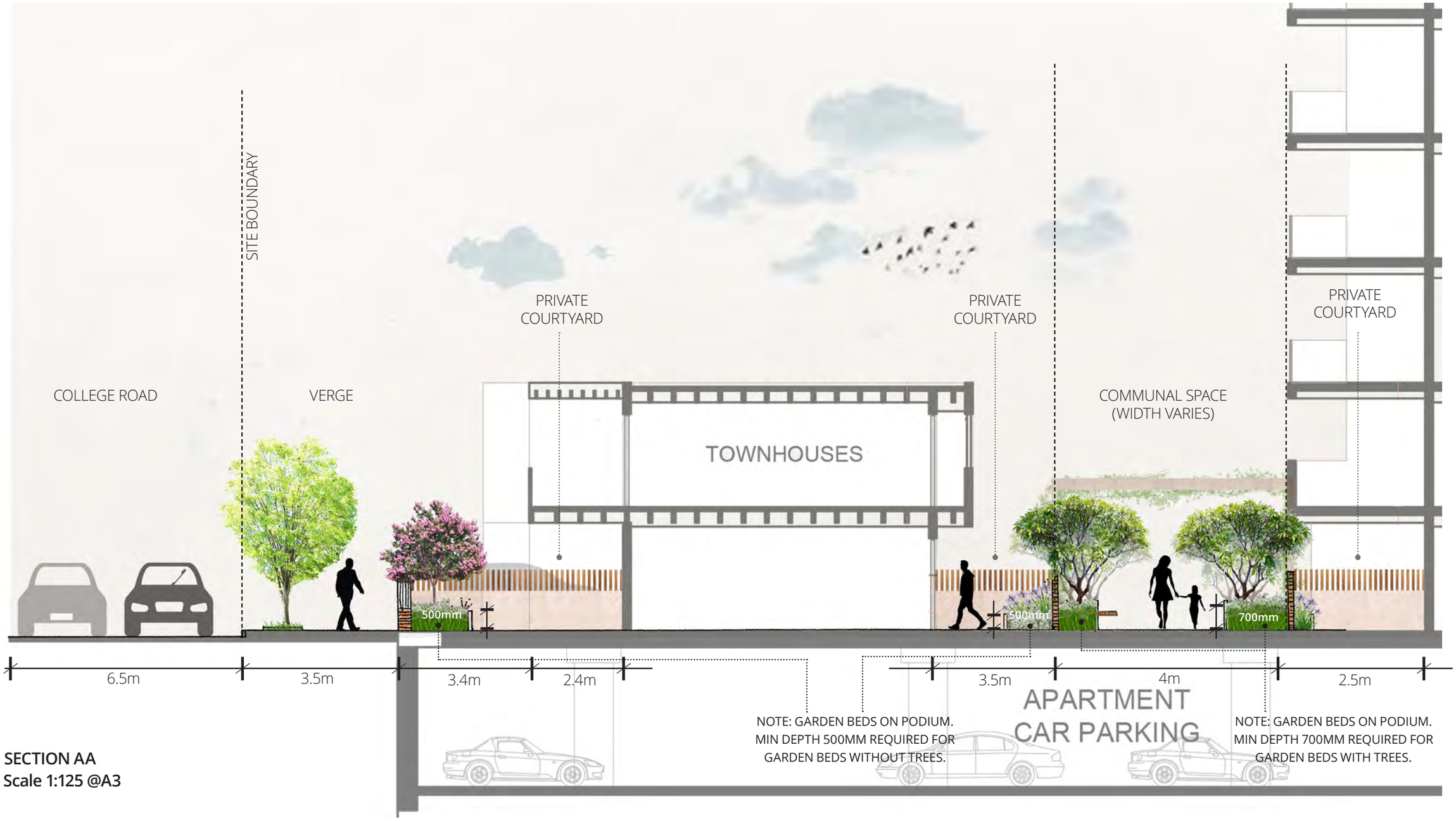

05


06


07

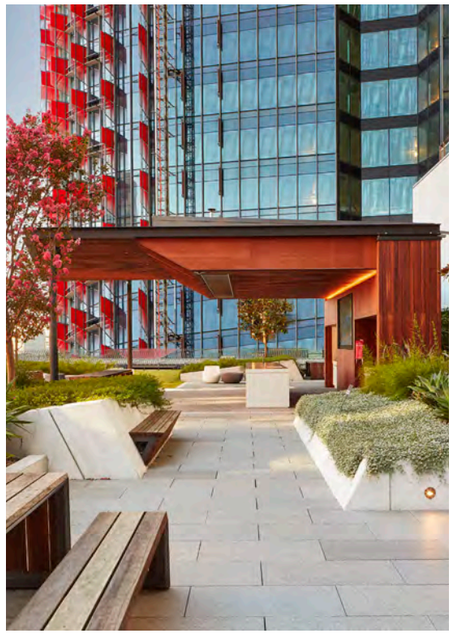

08

Sections

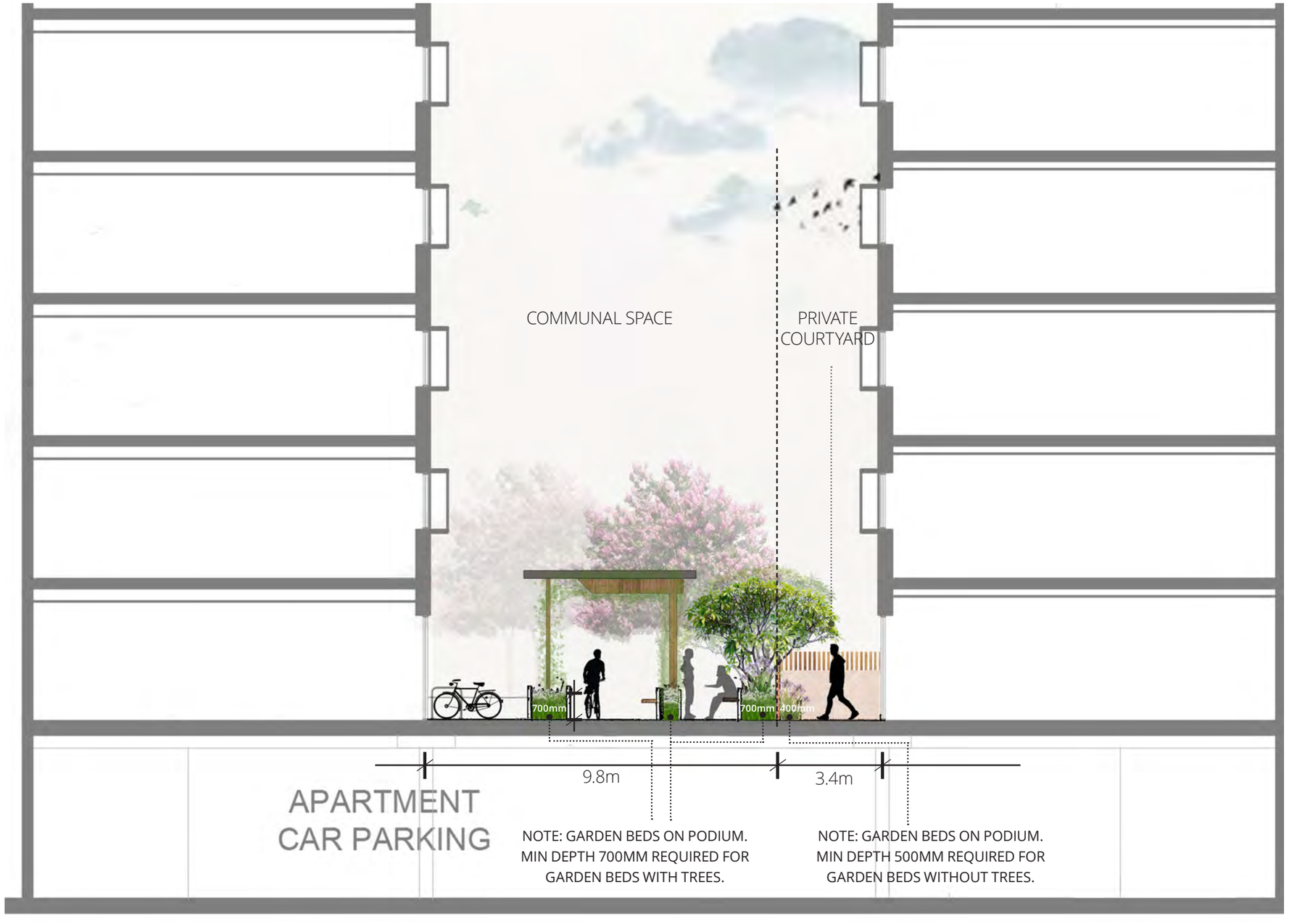


SECTION AA
Scale 1:125 @A3

Sections



Larger arbor to entry to assist wind mitigation.



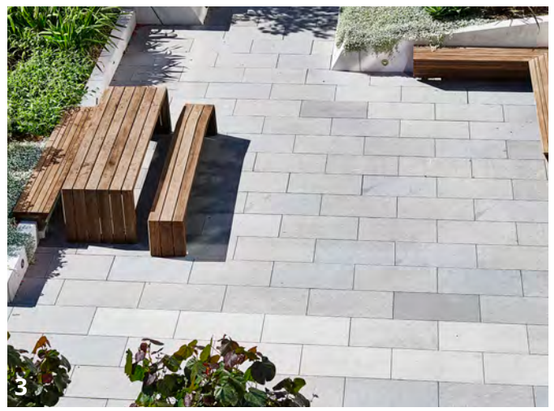
SECTION BB
Scale 1:125 @A3

Indicative Material Palette

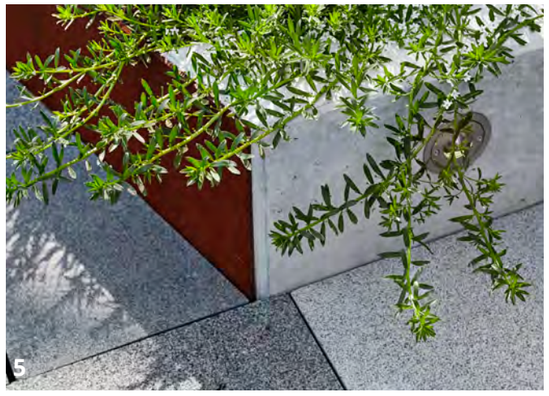
1. Custom timber bench seats
2. Exposed aggregate concrete paths
3. Residential feature paving
4. Feature recycled red brick pavers
5. Concrete and corten raised garden beds with lighting
6. Timber arbor
7. Picnic settings and outdoor BBQ
8. Climbing plants and feature planting
9. Courtyard walls (timber screens)
10. Courtyard walls (timber screens)
11. Wire cable system to selected walls/fences























Indicative Plant Palette

Trees



Bambusa textilis 'Gracillis'
Slender Weaver's Bamboo
(proposed for podium)



Cupaniopsis anacardioides
Tuckeroo
(proposed for podium)



Plumeria rubra
Frangipani
(proposed for podium)



Lagerstroemia indica
Crepe Myrtle
(proposed for podium)



Zelkova serrata
Green Vase
(proposed for streetscape)

Indicative Plant Palette

Mass Planting: shrubs and groundcovers

1. *Agave attenuata*
   Century Plant
2. *Asparagus densiflorus 'myersii'*
   Foxtail Fern
3. *Ajuga reptans 'Catlins Giant'*
   Catlins Giant Bugle
4. *Caprobotus glaucescen*
   Native Pig Face
5. *Cycas revoluta*
   Sago Palm
6. *Dichondra argenta 'Silver Falls'*
   'Silver Falls' Dichondra
7. *Dianella caerulea 'Little Jess"*
   'Little Jess' Flax Lily
8. *Dietes bicolor*
   Chocolate Lily
9. *Echium candicans*
   Pride of Madeira
10. *Grevillea sericea*
    Silky Grevillea
11. *Liriope muscari*
    Lily Turf
12. *Myoporum parvifolium*
    Creeping Boobiala
13. *Senecio serpens*
    Blue Chalk Sticks
14. *Tulbaghia violacea*
    Society Garlic
15. *Westringia fruticosa '*
    Native Rosemary


1


2


3


4


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10


11


12


13


13


13

pruszinski architects
172 pulteney street, adelaide 5000 / 08 82233123 / www.prusarch.com.au

25 College Road, Kent Town

Apartment Storage Volume

Apartment Type	bedrooms	number of residences	bicycle storage	bathroom cupboards	linen / storage	laundry	TOTAL	Storage Cage Allocaton	TOTAL
Type 1A	2	5		0.4	2.44	0.6	3.44	3.8	7.24
Type 1B	2	5		0.4	1.8	0.4	2.6	3.8	6.4
Type 1C	2	4		0.4	2.11	0.6	3.11	3.8	6.91
Type 1D	1	4		0.2	1.3	0.4	1.9	5.4	7.3
Type 1E	1	1		0.2	0.68	0.8	1.68	5.4	7.08
Type 2A	2	6		0.4	1.78	0.6	2.78	4	6.78
Type 2B	2	6		0.2	0.4	1	1.6	6.5	8.1
Type 2C	2	4		0.2	1.8	1.1	3.1	3.8	6.9
Type 2D	2	4		0.4	2.1	1	3.5	3.8	7.3
Type 2E	1	2		0.2	1.78	0.6	2.58	3.8	6.38
Type 2F	1	2		0.2	3.3	0.4	3.9	3.8	7.7
Type 2G	1	2		0.2	1.6	0.2	2	5.4	7.4
Type 3A	2	5		0.4	1.78	0.6	2.78	4	6.78
Type 3B	2	5		0.2	0.4	0.8	1.4	7.5	8.9
Type 3C	2	5		0.4	0.6	1.1	2.1	5.4	7.5
Type 3D	2	5		0.4	3.36	0.8	4.56	3.8	8.36
Type 3E	2	3		0.2	1.8	1.1	3.1	4	7.1
Type 3F	1	2		0.2	1.78	0.6	2.58	3.8	6.38
Townhouse Type 1	3	6	Garage	0.6	6.84	1.4	8.84		
Townhouse Type 2	3	2	Garage	0.6	6.02	1.6	8.22		

Car Park Storage Volume

Storage	total		volume
Car Park Levels	70		314m3

TMK CONSULTING ENGINEERS

Job No: 1607180
FEBRUARY 2017

HEATING AND COOLING LOAD ASSESSMENT

COLLEGE ROAD DEVELOPMENT
25 COLLEGE ROAD, KENT TOWN, SA

FOR PLANNING

PREPARED FOR: SCOPE DEVELOPMENT SOLUTIONS

Prepared By: Craig Jaber
Engineer - Energy Assessor
Registration Number: HE 187

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY 1
2 INTRODUCTION 2
3 RESULTS 3
3.1 INTRODUCTION 3
3.2 BUILDING 1 3
3.3 BUILDING 2 4
3.4 BUILDING 3 5
4 STAR RATING 6
4.1 INTRODUCTION 6
4.2 OUTCOME 6
5 APPENDIX 8

1 EXECUTIVE SUMMARY

The purpose of this report is to provide a preliminary analysis of the energy efficiency of the proposed apartment building on College Road, Kent Town SA.

There are three proposed apartment buildings with building 1 containing 19 apartments, building 2 containing 26 apartments and finally, building 3 containing 25 apartments.

Section J0.2 of the Building Code of Australia 2016 states that "*the sole-occupancy units of a Class 2 building or a Class 4 part of a building must—*

a) for reducing the heating or cooling loads—
   i. collectively achieve an average energy rating of not less than 6 stars; and
   ii. individually achieve an energy rating of not less than 5 stars, using house energy rating software;

Therefore, each apartment must achieve a minimum 5 star rating, with the average star rating for the entire building being no less than 6 stars.

The Star ratings have been calculated utilising FirstRate v5.2.4, a house energy rating software accredited under the Nationwide House Energy Rating Scheme (NatHERS).

A summary of the results are outlined below:

Building 1:

i. R2.5 insulation is required to all external walls
ii. R5.0 insulation is required to all exposed roof spaces
iii. R2.0 insulation is required to all exposed suspended floors
iv. Type D apartment on levels 1 to 4 and Type B apartment on level 4:
   a. Glazing requirements: double glazed low-e glass (U=4.3, SHCG=0.47)
v. All other apartments:
   a. Glazing requirements: single glazed low-e glass (U=5.4, SHCG=0.49)

Building 2:

i. R2.5 insulation is required to all external walls
ii. R5.0 insulation is required to all exposed roof spaces
iii. R2.0 insulation is required to all exposed suspended floors
iv. All apartments:
   a. Glazing requirements: single glazed low-e glass (U=5.4, SHCG=0.49)

Building 3:

i. R2.0 insulation is required to all external walls
ii. R5.0 insulation is required to all exposed roof spaces
iii. R1.0 insulation is required to all exposed suspended floors
iv. All apartments:
   a. Glazing requirements: single glazed low-e glass (U=5.4, SHCG=0.49)

2 INTRODUCTION

The objective of this report is to:

a. Determine the outcome of House Energy Simulation for the proposed dwelling against the star rating scheme.
b. The program that has been used for this simulation was FirstRate Ver 5.2.4 which is approved software by CSIRO.

The aim of this report is to:

a. Prove the energy consumption for the proposed dwelling will achieves a minimum of 6 star rating by using the building materials as listed in the FirstRate feature report.

3 RESULTS

3.1 INTRODUCTION

These energy requirements have been calculated using a standard set of occupant behaviors and so do not necessarily represent the usage pattern or lifestyle of the intended occupants. They should be used solely for the purposes of rating the building. They should not be used to infer actual energy consumption or running costs.

In order to achieve a minimum of 6 stars house energy rating, the following are required:

3.2 BUILDING 1

Insulation						
Level	**Apartment**	**Walls: External & Bounding Carpark**	**Walls: Bounding Apartments & Lobby**	**Ceiling**	**Roof**	**Floor**
Ground Level	Apartments	R2.5	n/a	n/a	n/a	n/a
Level 1	Apartments	R2.5	n/a	n/a	n/a	R2.0
Level 2	Apartments	R2.5	n/a	n/a	n/a	n/a
Level 3	Apartments	R2.5	n/a	n/a	n/a	n/a
Level 4	Apartments	R2.5	n/a	n/a	n/a	n/a
Level 5	Apartments	R2.5	n/a	n/a	R5.0	n/a

Glazing				
Level	**Apartment / Location**	**U Value**	**SHGC**	**Requirement**
Ground	Apartments	5.4	0.49	All windows and sliding doors must achieve an overall system (framing, etc) U-Value Shading Coeff as specified
Level 1	Apartments 1D	4.3	0.47	
Level 1	Apartments 1A, 1B, 1C	5.4	0.49	
Level 2	Apartments 1D	4.3	0.47	
Level 2	Apartments 1A, 1B, 1C	5.4	0.49	
Level 3	Apartments 1D	4.3	0.47	
Level 3	Apartments 1A, 1B, 1C	5.4	0.49	
Level 4	Apartments 1B & 1D	4.3	0.47	
Level 4	Apartments 1A & 1C	5.4	0.49	

3.3 BUILDING 2

Insulation						
Level	**Apartment**	**Walls: External & Bounding Carpark**	**Walls: Bounding Apartments & Lobby**	**Ceiling**	**Roof**	**Floor**
Level 1	Apartments (with carpark below)	R2.5	n/a	n/a	n/a	R2.0
Level 2	Apartments	R2.5	n/a	n/a	R5.0	n/a
Level 3	Apartments	R2.5	n/a	n/a	n/a	R2.0
Level 4	Apartments	R2.5	n/a	n/a	n/a	n/a
Level 5	Apartments	R2.5	n/a	n/a	n/a	n/a
Level 6	Apartments	R2.5	n/a	n/a	R5.0	n/a

Glazing				
Level	**Apartment / Location**	**U Value**	**SHGC**	**Requirement**
Level 1	Apartments (with carpark below)	5.4	0.49	All windows and sliding doors must achieve an overall system (framing, etc) U-Value Shading Coeff as specified
Level 2	Apartments	5.4	0.49	
Level 3	Apartments	5.4	0.49	
Level 4	Apartments	5.4	0.49	
Level 5	Apartments	5.4	0.49	
Level 6	Apartments	4.3	0.47	

3.4 BUILDING 3

Insulation						
Level	**Apartment**	**Walls: External & Bounding Carpark**	**Walls: Bounding Apartments & Lobby**	**Ceiling**	**Roof**	**Floor**
Level 1	Apartments (with carpark below)	R2.0	n/a	n/a	n/a	R1.0
Level 2	Apartments	R2.0	n/a	n/a	n/a	n/a
Level 3	Apartments	R2.0	n/a	n/a	n/a	R1.0
Level 4	Apartments	R2.0	n/a	n/a	n/a	n/a
Level 5	Apartments	R2.0	n/a	n/a	R5.0	n/a

Glazing				
Level	**Apartment / Location**	**U Value**	**SHGC**	**Requirement**
Level 1	Apartments (with carpark below)	5.4	0.49	All windows and sliding doors must achieve an overall system (framing, etc) U-Value Shading Coeff as specified
Level 2	Apartments	5.4	0.49	
Level 3	Apartments	5.4	0.49	
Level 4	Apartments	5.4	0.49	
Level 5	Apartments	5.4	0.49	

4 STAR RATING

4.1 INTRODUCTION

Typical apartments were assessed in each floor, including apartments above basement, between floors and top apartments. In addition, apartments facing all facades were assessed to determinate glazing and insulation requirements.

4.2 OUTCOME

With the glazing and insulation proposed, the star ratings demonstrate that not all apartments achieve a minimum of 5 stars and however, collectively they achieve a star rating of not less than 6 stars

BUILDING 1			
Unit	**Star Rating**	**Unit**	**Star Rating**
L0-1A	6.8	L3-1A	6.3
L0-1B	5.7	L3-1B	5.2
L0-1E	8.1	L3-1C	6.8
L1-1A	6.3	L3-1D	5.2
L1-1B	5.3	L4-1A	5.4
L1-1C	6.9	L4-1B	5.3
L1-1D	5.7	L4-1C	6.1
L2-1A	6.3	L4-1D	5
L2-1B	5.3		
L2-1C	6.8		
L2-1D	5.5		
Average	**6.0**		

BUILDING 2			
Unit	**Star Rating**	**Unit**	**Star Rating**
L1-2A	6.4	L4-2A	6.4
L1-2B	5.7	L4-2B	5.7
L1-2E	5.9	L4-2C	6.4
L1-2F	6.5	L4-2D	5.6
L1-2G	5.9	L5-2A	6.3
L2-2A	6.4	L5-2B	5.7
L2-2B	5.8	L5-2C	6.4
L2-2E	5.9	L5-2D	5.6
L2-2F	6.2	L6-2A	5.9
L2-2G	5.7	L6-2B	5.9
L3-2A	6.4	L6-2C	5.9
L3-2B	5.7	L6-2D	5.1
L3-2C	6.4		
L3-2D	5.6		
Average	**6.0**		

BUILDING 3			
Unit	**Star Rating**	**Unit**	**Star Rating**
L1-3A	5.9	L4-3A	6.3
L1-3B	5.7	L4-3B	5.9
L1-3C	7.4	L4-3C	7.4
L1-3D	5.8	L4-3D	5.8
L1-3F	6.3	L4-3E	7
L2-3A	6.3	L5-3A	5.7
L2-3B	5.9	L5-3B	5.4
L2-3C	7.5	L5-3C	6.8
L2-3D	5.8	L5-3D	5.3
L2-3F	6.7	L5-3E	6.3
L3-3A	6.3		
L3-3B	5.9		
L3-3C	7.5		
L3-3D	5.8		
L3-3E	7.1		
Average	**6.3**		

Builder to ensure compliance with the following requirements:

J0.2 (b) general thermal construction, comply with J1.2
J0.2 (c) thermal breaks, comply with J1.3(d) and J1.5(c)
J0.2 (d) for compensating for a loss of ceiling insulation, comply with J1.3(c)
J0.2 (e) floor edge insulation, comply with J1.6(c) and J1.6(d)
J0.2 (f) building sealing comply with Part J3

5 APPENDIX

Star Rating

Features report

OFFICE FOR DESIGN + ARCHITECTURE SA

File No:
2014/11235/01

Ref No:
11522993

Pre-lodgement Agreement

ODASA Pre-lodgement No: PLA 2016/13811/01

Pursuant to Section 37AA of the Development Act, this Agreement obviates the need for a statutory referral to the South Australian Government Architect during the Development Assessment Commission assessment process. The Development Assessment Commission refers all applicable development proposals to the Associate Government Architect, for review and comments on design merit. The Agreement must be lodged with the development application, and the application lodged within three months of the Agreement being signed.

The Agreement between the **South Australian Associate Government Architect** and **25 CKT Pty Ltd** (the Proponent), signed on **18 May 2017** pertains to the development proposal for **25 College Road, Kent Town** described in the drawings listed in the schedule below, reviewed by the Associate Government Architect on 18 May 2017. The drawings form part of the Agreement.

This Agreement is not an approval to proceed with the proposal. Development Approval from the Development Assessment Commission must be obtained prior to commencing work.

Development description
The proposal is a residential only development with a combination of two storey townhouses and five, six and seven storey apartment buildings. There are eight townhouses and 70 apartments proposed. As the site provides approximately 4m of elevation from the lower back lane, the ground floor car parking sits under the College Road level to the north and provides the street wall and podium to the south.

Drawing Schedule

Drawing Number	Drawing Details	Issue No	Date
	Pruszinski Architects		
00	Cover Sheet	n/a	n/a
01	Site and Location Plan	05	23.02.2017
02	Ground Floor Plan	06	11.04.2017
03	Level 1 Floor Plan	06	11.04.2017
04	Level 2 Floor Plan	06	11.04.2017
05	Level 3 – 4 Floor Plan	06	11.04.2017
06	Level 5 Floor Plan	06	11.04.2017
07	Level 6 Floor Plan	06	11.04.2017
08	Inspirations	05	23.02.2017
09	Elevations	05	23.02.2017
10	Perspectives	06	11.04.2017
11	Streetscapes	05	23.02.2017

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Government of South Australia

OFFICE FOR DESIGN + ARCHITECTURE SA

File No:
2014/11235/01

Ref No:
11522993

Drawing Number	Drawing Details	Issue No	Date
12	Streetscapes	05	23.02.2017
13	Sections	05	23.02.2017
14	Sunshading	05	23.02.2017

Drawing Details	Drawing Number	Date/ Revision
ASPECT Studios – Landscape Concept Report Revision 4 April 2017		
Cover Sheet		April 2017
Contents	02	
Concept Design Landscape Master Plan	03	April 2017
Landscape Master Plan Landscape Precedents: Key Spaces	04	April 2017
Concept Design Sections	05	April 2017
Concept Design Sections	06	April 2017
Design Palette Indicative Material Palette	07	April 2017
Design Palette Indicative Plant Palette	08	April 2017
Design Palette Indicative Plant Palette	09	April 2017

Advisory Notes

The project was presented to the Design Review Panel twice, over which period the design response progressed significantly.

The subject site of approximately 4,000 square metres is located in Kent Town between College Road and Little Young Street, towards the intersection of Flinders Street and The Parade West. The surrounding land uses include small scale commercial offices and tenancies, attached and detached residential buildings, restaurants and cafes. A five storey boarding house building is proposed by Prince Alfred College on the south west side of Little Young Street opposite the subject site.

The proposal consists of a block of two storey townhouses presenting to College Road and three separate apartment buildings located towards the Little Young Street boundary. The apartment buildings vary in heights of five, six and seven storeys including the semi-undercroft car parking level. The buildings appear as four, five and six storeys respectively viewed from College Road, as the site falls approximately four metres towards Little Young Street. The parapet height of the tallest building is 23.9 metres as measured from Little Young Street, and 17.5 metres as measured from College Road. While two of the apartment buildings exceed the envisaged maximum height of five storeys, I support the proposed heights and density of the development. In my opinion, the current massing and varied heights of the apartments is a successful response to the

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Government of South Australia

File No:
2014/11235/01

Ref No:
11522993

size and location of the allotment and the unique opportunity it offers. In addition, the composition of the built forms achieve appropriate permeability through the site overall, and the open spaces between apartment buildings reduce the visual impact of the large scale development and integrate the building into the existing streetscape context.

While the proposed number of crossovers to College Road has the potential to negatively impact the existing character of the street, I support the proposed configuration on balance, as the street interface is sensitively designed in consultation with the landscape architect to ensure amenity for pedestrians. A two storey tall perforated brick facade treatment is proposed to the Little Young Street frontage to screen the at grade car parking and to form the podium element. I support the approach to respond to the fine grain of the locality by the use of bricks, and to create a human scale interest at the street level by providing three dimensionally sculpted elements. I also support the provision of the glazed elevation for an adaptive re-use space to the south east corner of the site, as this part of site will likely to be visible from The Parade West with the proposed boarding house development unlocking the sight line at the corner of Little Young Street and The Parade West.

I strongly support the provision of the publicly accessible connection between College Road and Little Young Street. I also support the provision of the communal open spaces that offer high quality amenity to the residents. It is important to the overall success of the project that the continued involvement of a landscape architect is maintained during the next phase of design development and documentation, to ensure successful outcomes for the open spaces.

The proposed architectural expression of the apartment buildings draws inspiration from the existing BOM building on site, which is characterised by strong concrete forms with deep horizontal recesses and curved vertical elements. Bricks are selected for the lower part of the apartment buildings to provide contextual reference to the established character of the locality. I support the form and materiality of the apartment buildings, as they are well proportioned and offer a sculptural quality.

The architectural expression of the two storey townhouses are familiarly residential. I support the proposed approach, as the townhouses respond to the established scale and character of the residential area, while remaining to be coherent with the overall development.

Apartment and townhouse layouts indicate a variety of accommodation types being offered, which I support. I also support the internal planning strategies that offer generous room sizes and access to natural light and ventilation. Regarding the apartment buildings, I support the provision of three separate buildings to create more corner apartments and increased amenity. I also support the size and proportions of the balconies. With the five storey apartment building, I strongly support the provision of active use spaces to the Little Young Street frontage.

The simple and strong geometry of the building relies on precise and high quality material selection and detailing. To ensure the most successful design outcome is achieved the Development Assessment Commission may like to consider

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OFFICE FOR DESIGN + ARCHITECTURE SA

File No:
2014/11235/01

Ref No:
11522993

conditions or reserved matters to protect the following elements of the proposal, as design details are produced in due course:

- Details of the refinement to the exposed concrete details, to ensure the final execution is consistent with the current intent.
- Final schedule of materials for landscaped areas.
- Final samples of selected materials.

ODASA Pre-lodgement Agreement No: PLA 2016/13811/01

25 College Road, Kent Town

South Australian Associate Government Architect

Signature
Nick Tridente

Date 18th May 2017

The Proponent

Signature
David Cargill
Major Projects Manager
Scope Development Solutions
Level 5, 100 Pirie Street
Adelaide SA 5000

Date 22nd May 2017

Representing

25 CKT Pty Ltd

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Government of South Australia

SOUTH AUSTRALIAN DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant:	Scope Development Solutions
Development Number:	155/M006/17
Nature of Development:	Three residential flat buildings, eight townhouses and associated carparking landscaping and ancillary works
Type of development:	Merit
Zone / Policy Area:	Urban Corridor Zone / High Street 14.3 Policy Area
Subject Land:	25 College Road, Kent Town
Contact Officer:	Tom Victory
Phone Number:	8402 1843
Close Date:	5pm, Fri 23 June 2017

My name: GEORGE HAGIDIMITRIOU

My phone number: 0419 219 491

PRIMARY METHOD(s) OF CONTACT: Email address: info@omikron.net.au

Postal address: P.O. Box 272

Campbelltown Postcode 5074

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- [X] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 44 The Parade West Postcode 5067

The specific aspects of the application to which I make comment on are:

- PRIVACY ~~CONCERNS FROM WINDOWS & BALCONY~~
- SHADING ~~ONTO PROPERTY~~
- SETBACKS

Should the Development Assessment Commission conduct a public hearing for this Development Application:

I

- [X] **wish to be heard in support of my submission**
- [ ] **do not wish to be heard in support of my submission**

(Please tick one)

By

- [X] appearing personally
- [ ] **being represented by the following person:**

(Please tick one)

Date 23/6/2017 Signature G Hagidimitriou

Return Address: The Secretary, Development Assessment Commission, GPO Box 1815, Adelaide SA 5001 or dacadmin@sa.gov.au

SOUTH AUSTRALIAN DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant:	Scope Development Solutions
Development Number:	155/M006/17
Nature of Development:	Three residential flat buildings, eight townhouses and associated carparking landscaping and ancillary works
Type of development:	Merit
Zone / Policy Area:	Urban Corridor Zone / High Street 14.3 Policy Area
Subject Land:	25 College Road, Kent Town
Contact Officer:	Tom Victory
Phone Number:	8402 1843
Close Date:	5pm, Fri 23 June 2017

My name: Dr. Sharyn Schubert

My phone number: 04 21 391 450

PRIMARY METHOD(s) OF CONTACT: Email address: s schubert@sac.sa.edu.au

Postal address: 15 College Road
Kent Town Postcode 5067

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 15-17 College Road, Kent Town Postcode 5067

The specific aspects of the application to which I make comment on are:

① Sustainable design elements – areas needing consideration are (a) provision of photovoltaic cells (b) roof-top gardens (Develop. Plan Clause 225 pg. 27)

② Innovative design elements – areas needing consideration are (a) public Art in communal area (D. Plan Objective 64 pg. 58) + communal garden (b) clear differentiated + well lit public, private + communal areas (c) mixed use in urban corridors to encourage employment e.g. little Young Street street level provision for Gym, swimming pool, hairdressers + deli.

Should the Development Assessment Commission conduct a public hearing for this Development Application:

I

- [x] **wish to be heard in support of my submission**
- [ ] **do not wish to be heard in support of my submission**

(Please tick one)

By

- [x] **appearing personally**
- [ ] **being represented by the following person:**

(Please tick one)

Date 23/6/2017 Signature S. A. Schubert

Return Address: The Secretary, Development Assessment Commission, GPO Box 1815, Adelaide SA 5001 or dacadmin@sa.gov.au

SOUTH AUSTRALIAN DEVELOPMENT ACT, 1993
REPRESENTATION ON APPLICATION – CATEGORY 2

Applicant:	Scope Development Solutions
Development Number:	155/M006/17
Nature of Development:	Three residential flat buildings, eight townhouses and associated carparking landscaping and ancillary works
Type of development:	Merit
Zone / Policy Area:	Urban Corridor Zone / High Street 14.3 Policy Area
Subject Land:	25 College Road, Kent Town
Contact Officer:	Tom Victory
Phone Number:	8402 1843
Close Date:	5pm, Fri 23 June 2017

My name: PAUL SCHUBERT

My phone number: 0431 522 978

PRIMARY METHOD(s) OF CONTACT: Email address: topaul@adam.com.au

Postal address: 15 COLLEGE ROAD, KENT TOWN STH. AUST. Postcode 5067

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 17 COLLEGE ROAD, KENT TOWN / 15 COLLEGE ROAD, KENT TOWN / 10 GRENFELL ST, KENT TOWN Postcode 5067

The specific aspects of the application to which I make comment on are:

1) OVERLOOKING – Particularly from the Northern most building on EXISTING RESIDENCE & BACKYARD REFER ILLUSTRATION A ATTACHED OVER PAGE (2/3)
REFER PLAN B ATTACHED FOLLOWING PAGE (3/3)

2) I think an innovative residential project of this size should include a central gathering place as well as a community garden where occupants can grow vegetables etc

Should the Development Assessment Commission conduct a public hearing for this Development Application:

I

- [x] **wish to be heard in support of my submission**
- [ ] **do not wish to be heard in support of my submission**

(Please tick one)

By

- [x] **appearing personally**
- [ ] **being represented by the following person:**

(Please tick one)

Date 22/06/2017 Signature P Schubert

Return Address: The Secretary, Development Assessment Commission, GPO Box 1815, Adelaide SA 5001 or dacadmin@sa.gov.au

ILLUSTRATION A



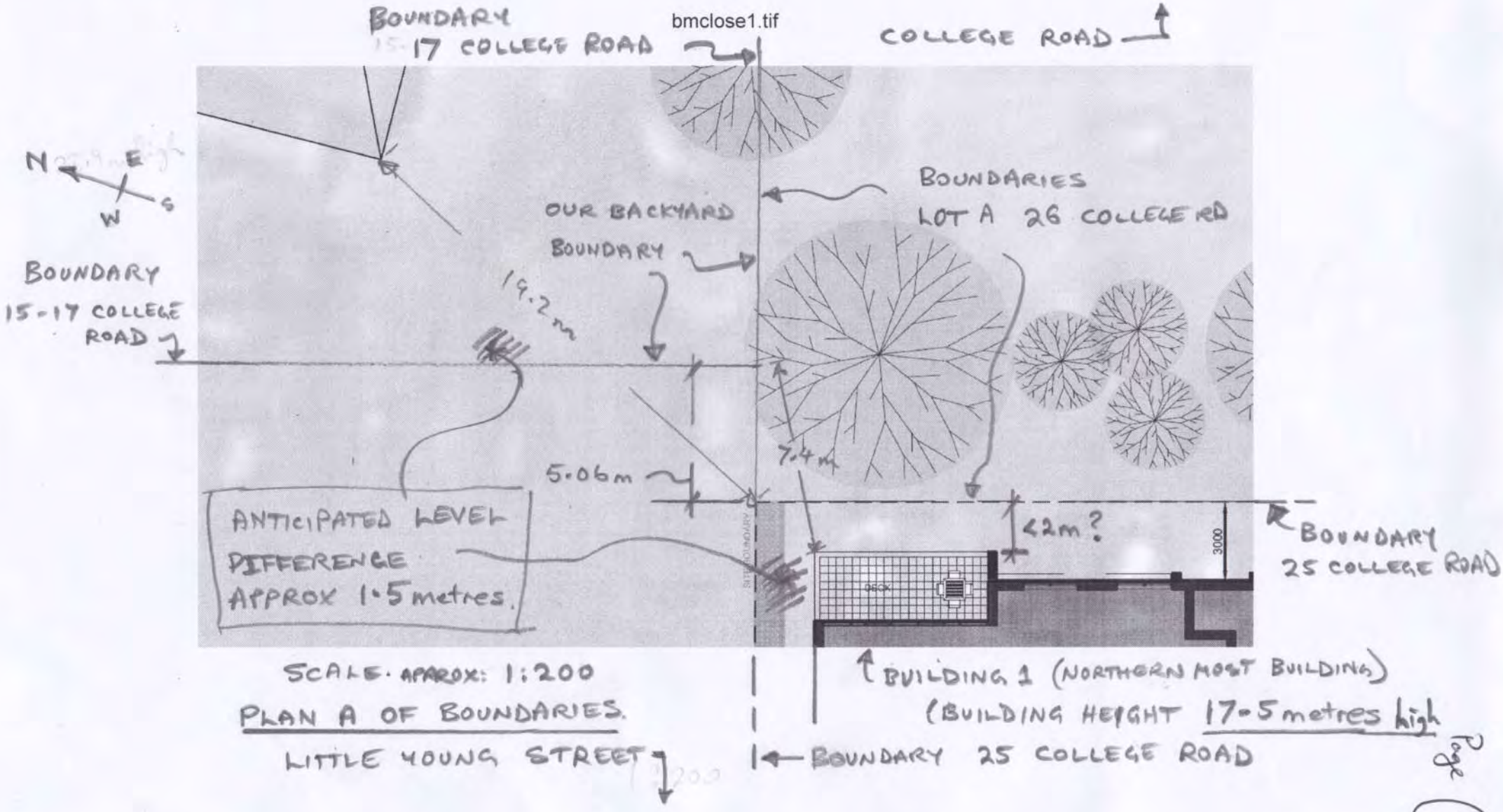
Northern most building
25 College Road, Kent Town

Artists impression of the Proposed Building showing overlooking

for Development Assessment Commission
Attn: Tom Victory

22/06/2017 PGS

PLAN B


BOUNDARY
17 COLLEGE ROAD
bmclose1.tif
COLLEGE ROAD
N
E
S
W
BOUNDARY
15-17 COLLEGE ROAD
OUR BACKYARD
BOUNDARY
BOUNDARIES
LOT A 26 COLLEGE RD
19.2m
7.4m
5.06m
ANTICIPATED LEVEL DIFFERENCE APPROX 1.5 metres.
<2m?
3000
DECK
BOUNDARY
25 COLLEGE ROAD
SCALE. APAROX: 1:200
PLAN A OF BOUNDARIES.
LITTLE YOUNG STREET
BUILDING 1 (NORTHERN MOST BUILDING)
(BUILDING HEIGHT 17-5 metres high
BOUNDARY 25 COLLEGE ROAD

ACCESS PLANNING

Access Planning (SA) Pty Ltd
ABN 57 089 702 241

235 Henley Beach Road
Torrensville SA 5031

Telephone 08 8130 7222
Facsimile 08 8130 7299
admin@accessplanning.com.au

www.accessplanning.com.au

23 June 2017

Ref: 6885submission

The Chairman
Development Assessment Commission
PO Box 1815
Adelaide SA 5000

Attention Mr. Tom Victory

Dear Tom

Re: **DEVELOPMENT APPLICATION 155/M006/17 – PROPOSED RESIDENTIAL DEVELOPMENT 25 COLLEGE STREET, KENT TOWN**

I have been engaged by Prince Alfred College (PAC) to assess and provide advice to them in respect to the above mentioned development.

Unfortunately my instructions in relation to this matter have only been received on today's date, and as a consequence my comments are necessarily brief.

I am instructed that PAC do not object to the development 'per se', but have issues with the overall height and density of the development, and consequent impacts arising from overshadowing and overlooking that will directly affect their land at 36 The Parade West, Kent Town.

The land at 36 The Parade West is subject to approval for a 5 storey residential student accommodation development, which is shown as 'Future Boarding House' on the site plan PLA 01 lodged with the present application.

In reviewing the development proposed by PAC, the Office for Design and Architecture noted the consistency of the development with the 5 store height limit applicable to the Urban Corridor Zone and Policy Area.

Areas of concern to PAC include the density of the development, overlooking and overshadowing impacts.

As identified in the planning submission prepared by Heynen Planning Consultants, I have assessed the site density at 232 dwellings per hectare. Unlike Heynan Planning, I do not consider that this density accords with Zone principle 5; which for the High Street Policy Area envisages a dwelling density in the order 70 dwellings per hectare.

Whilst I note that the figure of 70 dwellings per hectare is expressed as a minimum, the proposed density of 232 dealings per hectare is an increase of nearly $3^1/_2$ times, and is well in excess of the higher density expressed for the Boulevard Policy Area.

The author of the Development Plan has established a hierarchy of Policy Areas within the Urban Corridor Zone culminating in a reduction of building height and dwelling density at the edges of the zone, transitioning from the Boulevard Policy Area (medium density relative to the zone provisions), which fronts North Terrace, to the Business Policy Area (high density), which essentially sits between the Boulevard Policy Area and the High Street Policy Area

(low density), with the lowest density of development being allocated to the High Street Policy Area.

The principal reason for establishing the High Street Policy Area is in recognition of its direct relationship to adjoining, low scale development zones and the Historic (Conservation) zones which directly adjoin the subject land to the north east, and are in close proximity to the south west.

This notion is supported by the wording of Zone objective 5, which seeks a transition in scale at the zone boundary, which although achieved in part by the development of 2 storey dwellings along the College Road frontage of the land, nevertheless fails to accord with those provisions of the Development Plan that seek to limit development in the High Street Policy Area to not more than 5 storeys, as expressed firstly in Zone principle 13, where building height is expressed as a maximum, and reinforced (strongly by repetition) in the Desired Character statement for the Policy Area, viz;

The locality will comprise buildings of up to five (5) storeys, with a podium or street wall height of two (2) storeys, and

Area E, shown on Concept Plan Fig UrC/1, provides an opportunity for development of up to five (5) storeys, except along the College Road frontage, where development will be limited to two (2) storeys.

The increased density proposed for the development has manifested itself in increased height to the building, taking the development from the envisaged 5 storeys to buildings of 6 and 7 storeys.

In undertaking their development, PAC were careful to comply with the building height limits expressed for the Zone and Policy Area. Noting that in their review of the PAC development the Office for Design and Architecture commented that;

"The site is located in a low-rise context opposite the main school campus and at a corner in The Parade West. Recent policy change envisage urban uplift along this main road, with a height increase to five stories. Any development on this site will set a precedent for the future built form along this section of the Parade, especially in terms of height, scale and treatment of the interface with the street. Consequently, there is a responsibility for this development to positively contribute to the streetscape, consistent with the regeneration ambitions in this is location."

In complying with the 5 story height limit, the PAC development has set a precent in the locality for the development to be confined to a maximum height of 5 storeys. Approval of the prosed development at higher levels than those provided for the in the Development Plan can only lead to establishing a precedent for further departures form the Development Plan on other sites in the Policy Area.

Impacts arising from the increased height and design of the building include a high potential for overlooking of the PAC development.

It is recognised that in zones that promote multi-storey development, that some level of overlooking will occur, as noted in the desired character statement

"At other locations within the Urban Corridor Zone, it is recognised that some level of overshadowing and overlooking will occur, however, this will be moderated through a range of

design techniques, which may include separation of buildings, orientation of windows and balconies and various forms of screening."

General Section principle 234 seeks to have multi storey development address overlooking by adopting screening and spatial separation measures as referred to below.

234 In areas where buildings of 3 or more storeys are contemplated, direct overlooking into habitable room windows or onto the useable private open spaces of other dwellings from upper level windows, external balconies, terraces and decks should be minimised through the adoption of one or more of the following methods and may be supplemented by landscaping:

(a) building layout;
(b) location and design of windows and balconies;
(c) screening devices; or
(d) adequate separation.

The proposed development is aligned along the frontage of Little Young Street with generous balcony areas to the frontage of all the apartments on this elevation. These balconies are the principle entertainment areas for each of the units and as such can be expected to be in use on a regular basis.

Glass balustrades are provided to some of the balconies, providing an unfettered view from within the adjoining living areas of the apartments into the PAC development. Low balcony walls adopted across the frontage of some of the apartments will assist in screening views from within the building to some extent, but do not stop overviewing from someone sitting or standing on the balconies.

Whilst PAC have endeavoured to design their development to minimise the impacts from overlooking from land external to their property, the proposed development does not in my view adequately respond to the design cues sought by principle 234.

In particular the orientation of living room windows to the west, the use of glass balustrading in place of solid or opaque balustrading and the location of the balconies and living room windows close to the boundary and aligned along Little Young Street; and thus in very close proximity to the PAC development, all result in overlooking impacts that could otherwise be mitigated.

Overshadowing is somewhat less of an issue but is nonetheless of concern to PAC.

It is to be expected that as the proposed development site is to the east of the PAC development that overshadowing impacts in the morning are to be expected, however, the increase in building height from 5 storeys to 6 and 7 storeys increases the impact on overshadowing, no matter how marginal.

In AG Building & Developments P/L v City of Holdfast Bay & Anor (No 2) [2009] SAERDC 31 (9 June 2009), the Environment Court had cause to revisit a decision remitted to it by the Supreme Court, to approve a multi storey apartment development on the foreshore at Hove to readdress, amongst other things, the impacts of the development on overshadowing adjoining land uses.

The Court ultimately refused the development as being *"insufficiently compatible or an acceptable fit for the site and the locality context within the zoning framework*."

The alterations necessary to bring the development into compliance with the Development Plan in relation to overshadowing were relatively minor, yet in its final assessment the Court determined that the application should be refused, citing overshadowing impacts as one of the reasons.

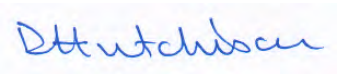
On appeal to the Supreme Court, The Honourable Justice Kourakis upheld the decision to refuse the development and referred specifically to the additional overshadowing impacts arising from the relatively minor non-compliance of the development with the building height provisions in the Development Plan.

In respect to the present development, one or two additional stories are not to be considered minor and will give rise to unacceptable and additional overshadowing impacts that would not arise were the development compliant with the height limits contained in the Development Plan.

Having regard to all of the above, I consider that the proposed development is sufficiently at odds with the Development Plan as to warrant refusal, or at least a redesign to bring the building heights into conformity with the 5 story height limit proposed for development in the zone and policy area and to better address issue arising from overlooking and overshadowing.

I advise that I wish to address the Development Assessment Commission when this matter comes before it to expand as necessary on the concerns of Prince Alfred College.

Yours sincerely



David Hutchison BA CPP PIA
Access Planning (SA) Pty Ltd.

HEYNEN
PLANNING CONSULTANTS

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KENSINGTON PARK SA 5068

ABN 54 159 265 022

26 July 2017

Scope Development Solutions
ATT: David Cargill
Level 5, 100 Pirie Street
ADELAIDE SA 5000

By Email

Dear David

RE: 155/M006/17 – 25 COLLEGE STREET, KENT TOWN

I understand that pursuant to Section 38 of the *Development Act* public notification has been undertaken in relation to DA 155/M006/17 and that four representations have been received.

Further to the receipt of the representations, I understand that you have reviewed the planning drawings and identified revisions which you are willing to be compelled to undertake by way of conditions of Development Plan consent as follows:

North-Western Residential Flat Building

- solid panel screens to be provided to the northern end of the decks as they relate to Apartment Type 1A for Level 1 and above located at the northern end of the building to direct views in a north easterly direction;
- obscure glazing is to be provided to the south west facing balustrade for decks (located between Bed 1 and lounge area) as they relate to Apartment Type 1D for Level 1 and above so as to direct views of seated occupiers in an upward direction;
- obscure glazing is to be provided to 75% of the south west facing windows for Bed 1 and 80% of the west facing windows for the lounge area as they relate to Apartment Type 1D for Level 1 and above so as to minimise potential lines of sight to adjoining land and buildings;

"Middle" Residential Flat Building

- obscure glazing is to be provided to the west facing balustrade for decks as they relate to Apartment Type 2A for Level 1 and above so as to direct views of seated occupiers of the deck (i.e. balcony) in an upward direction;

South-Eastern Residential Flat Building

- light weight louvre screens are to be fixed to the south-eastern elevation and placed in line with the two middle most bedrooms for Apartment Types 3A and 3C for Level 2 and above to avoid direct lines of sight;
- raise the window sill height to 1700 mm above finished floor level for the eastern most bedroom of Apartment Type 3C for Level 2 and above to avoid overlooking; and
- provide a solid screen to the boundary along the southern most extent of the decks for the Level 1 Apartment Type 3A and Apartment Type 3C to direct views of seated occupiers of the deck in an upward direction.

The above suggested revisions have been illustrated as per Supplemental A, C and B respectively, prepared by Pruszinski Architects, and I understand that you will provide these details to the Development Assessment Commission along with this correspondence.

In my opinion, there is no need to amend the current planning drawings as a condition(s) of Development Plan consent can be imposed and acceded to which requires (1) the details as per the sheets prepared by Pruszinski Architects to be incorporated into the Building Rules consent drawings, and (2) for the revised drawings to be provided to the Development Assessment Commission prior to issue of Development Approval.

As per your request, I have reviewed the issues raised in the representations, considered the supplemental sheets and provided my opinion to assist the remainder of the assessment process. On review, it is apparent that the representations have a degree of commonality and accordingly I have paraphrased the issues raised and provided my planning opinion thereafter.

Potential Loss of Privacy

A potential loss of privacy has been raised as an issue in relation to:

- overlooking from the southern most residential flat building to the adjoining property at 44 The Parade West;
- overlooking from the north western most residential flat building into the properties located at 10 Grenfell Street, and 15 and 17 College Road; and
- overlooking to the approved PAC boarding house development to the west from the proposed development as aligned along the frontage of Little Young Street.

Before considering the supplementary amendments to the proposed development I note that the following Development Plan provisions provide guidance with respect to overlooking (my underlining added):

> **City Wide**
> **PDC 234** In areas where buildings of 3 or more storeys are contemplated, direct overlooking into habitable room windows or onto the useable private open spaces of other dwellings from upper level windows, external balconies, terraces and decks should be minimised through the adoption of one or more of the following methods and may be supplemented by landscaping:
> (a) building layout;
> (b) location and design of windows and balconies;
> (c) screening devices; or
> (d) adequate separation.
>
> **PDC 264** Residential buildings (or the residential floors of mixed use buildings) should:
> (a) have adequate separation between habitable room windows and balconies from other buildings to provide visual and acoustic privacy for dwelling occupants and allow the infiltration of daylight into interior and outdoor spaces; and
>
> **Urban Corridor Zone – Desired Character**
> At other locations within the Urban Corridor Zone, it is recognised that some level of overshadowing and overlooking will occur, however, this will be moderated through a range of design techniques, which may include separation of buildings, orientation of windows and balconies and various forms of screening.

Consistent with the above provisions, I note that the "conventional" means of minimising overlooking (for example 1.7 m obscure glazing, sill heights and balcony dimensions etc) are specifically dispensed with on land within the Urban Corridor Zone – see for example PDC 235 below, my underlining added.

City Wide
PDC 235 Except where buildings of three or more storeys are contemplated within the Urban Corridor Zone and the District Centre (Norwood) Zone, in all other circumstances upper level windows, balconies, terraces and decks should:
(a) have a sill height of not less than 1.7 metres above the finished floor level (Refer to Figure 10); or …and
(d) in the case of balconies, not exceed 15 square metres in floor.

Additionally, I note that the Development Plan seeks the following outcomes (my underlining added):

PDC 264 Residential buildings (or the residential floors of mixed use buildings) should:
(b) ensure living rooms have, at a minimum, a satisfactory short range visual outlook to public or communal space.

Urban Corridor Zone – Desired Character
The residential component of all buildings will be designed having regard to the amenity of the occupants and will ensure that individual units have reasonable access to light, ventilation and views. Residential balconies will be designed to form an extension to the main living area…

Distilling the above provisions, a balance is to be struck between the achievement of views from balconies and residential components of buildings (which will necessitate balconies adjoining living rooms) and the minimisation of direct overlooking. The means by which direct overlooking is to be avoided include "(a) building layout; (b) location and design of windows and balconies; (c) screening devices; or (d) adequate separation."

Upon review of Supplemental A it is evident that closest overlooking "point" to 15 and 17 College Road is separated by way of the 7.8 m distance to the corner of the representors property, but moreso by way of the "screening device" to the northern most elevation (see "View A" and "View B"). In my opinion, the "visual outlook" from the Level 1 and above decks will predominantly be to the north-east and will therefore achieve an outcome consistent with the Desired Character for the Urban Corridor Zone.

In relation to Supplemental B it is apparent that views into the adjoining land at 44 The Parade West will be excluded by way of the external "screening devices" and the window sill height (i.e. "design of windows") for Levels 2 and above. In relation to views in a southerly direction from Level 1 the height of the solid screen and planter boxes (which do not enable a person to stand at the edge of the deck) will ensure that seated occupants of the deck spaces will not be able to overlook adjoining land.

In my opinion, the seated occupant scenario is the correct "test" for the Urban Corridor Zone as this is the position by which a person can gain prolonged and invasive views of adjoining land[1]. The view gained from a person moving around in a standing position on a deck, in my opinion, would not constitute direct overlooking that would reduce the amenity and functionality of the adjoining land and buildings.

With respect to Supplemental C I firstly note that views from the middle residential flat building and the southern residential flat building to the approved PAC building involve separation distances ranging from 11.8 m to 44.6 m.

[1] Such an interpretation is consistent with the Urban Corridor Zone – Desired Character which acknowledges that "some level of… overlooking will occur" and that overlooking will be "moderated". To apply a "greater test" would usurp the primacy of the Desired Character by imposing design techniques sought by City Wide 235 which is clearly intended for conventional dwellings (which would be contrary to proper planning practice).

Furthermore, the views to be gained are oblique in nature and not "direct" lines of sight. Returning to City Wide PDC 234, the orientation of the proposed buildings, living areas (internal and external) and distances involved are consistent with the design solution contemplated by the Development Plan (i.e. "(a) building layout; or (d) adequate separation").

It is apparent that potential for lines of sight could occur between the eastern "end" of the central wing of the PAC building and Bed 1, the lounge area and the deck as they relate to Apartment Type 1D for Level 1 and above.

In this first instance I note again that views from building to building will be oblique in nature and over distances ranging from 11.8 m to 12.35 m and to approximately 14 m.

Additionally, Supplemental C confirms that obscure glazing is to be provided to the west facing balustrade for the deck (located between Bed 1 and lounge area) so as to direct views of seated occupiers in an upward direction. This is to be combined with obscure glazing provided to 75% of the south west facing windows for Bed 1 and 80% of the west facing windows for the lounge area as they relate to Apartment Type 1D for Level 1 and above. As a consequence "direct overlooking" will be "minimised", while maintaining "a satisfactory short range visual outlook" (City Wide PDC 264).

In my opinion to require greater extent of obscure glazing would fundamentally undermine the functionality of the proposed dwellings and result in an outcome which is inconsistent with the Urban Corridor Zone Desired Character. Furthermore, requiring greater mitigation beyond Supplemental C would result in an outcome which is inconsistent with the clear longstanding guidance expressed in the matter of *Sorrell v Corporation of the City of Glenelg and Dendy* [1988] PAT No. 470, extract provided below:

> *"…Absolute privacy, that is, the creation of a situation in which the yard or garden of each dwelling cannot be overlooked at all from part of an abutting property, is a desirable but rather elusive phantom. The question is really one of whether the design or location of a multi storey development is such that it will or is likely to give rise to a level of overlooking which is, in the circumstances, either excessive or unwarranted."*
>
> (my underlining added)

In my opinion, the potential level of overlooking as proposed per the amended planning drawings is not excessive or unwarranted in the circumstances and clear policy expression of the Development Plan.

Potential Overshadowing

I note that the property at 44 The Parade West and the land to be developed by PAC to the west have raised concerns with respect to overshadowing. Upon review of the Pruszinski Architects sun shading diagrams it is clear that the orientation of the site and building design results in a development which is consistent with the following provision:

> **Urban Corridor Zone – Desired Character**
> At other locations within the Urban Corridor Zone, it is recognised that some level of overshadowing and overlooking will occur, however, this will be moderated through a range of design techniques, which may include separation of buildings, orientation of windows and balconies and various forms of screening.

In this regard, access to sunlight for the property at 44 The Parade West is largely unaffected by the proposed development between 9 am and 12 noon, while the shadow cast on the land to be developed by PAC will receive largely the same amount of shadow at 9 AM that is currently cast by the existing building located on the subject land.

Thereafter, the shadow cast by the proposed development at 12 noon will not diminish the use and enjoyment of the approved building, while the PAC land and building will be unaffected at 3 PM by the proposal.

In my opinion, concerns regarding overshadowing are not well founded.

I note that one representation referred to the matter of *AG Building & Developments P/L v City of Holdfast Bay & Anor* (No 2) [2009] SAERDC 31 and suggested that overshadowing was a substantive issue that may, due to an association with building height, warrant refusal of the proposed development.

Respectfully, it must be noted that the *AG Building* matter and the discussion with respect to overshadowing turned on (i) very different site and locality characteristics and (ii) unclear empirical detail regarding the extent of shadow cast. These elements are clearly distinguishable from the proposed development.

Furthermore, of greater relevance *AG Building and Developments Pty Ltd v City of Holdfast Bay & Tanti* [2009] SASC 11 outlined that the correct approach requires:

> *"…an assessment not of particular issues in watertight compartments, but rather as part of a single complex planning problem – whether the proposal as a whole should be approved."*

It is clear that overshadowing, and for that matter overlooking, are not issues which in isolation or as part of the whole "planning problem" reduce the substantial planning merit displayed by the proposed development.

Building Height

I note that one representation comments on the building height and number of storeys proposed by the development. I confirm that I have previously contemplated this aspect of the proposal and noted the representation. In this respect, my opinion has not altered from that expressed in the "Appropriateness of the Proposed Building Height" section of my Statement (v2 dated 30/4/2017) (which I will not repeat here for the sake of brevity.

Sustainable Elements and Innovative Design Elements

I note that one representation noted that no roof-top gardens of PV cells have been provided, while it also suggested that public art, community garden and differential lighting (two representations) could be better integrated into the communal area. In my opinion, the above items are not precluded by the proposed development, while it is also the case that the Community Corporation (which must be established as part of a consequential land division application) will be best placed to regulate and facilitate uses for the extensive common property areas.

Little Young Street Elevation Should Provide for Non-residential Uses

Upon review of the Development Plan provisions as a package, it is clearly intended that exclusively residential development is contemplated in "Area E" as assigned to the site, while vehicle access from Little Young Street (consistent with it vehicular service lane function) is sought. In the circumstances, the representation is not well made and mixed use development will continue to be achieved elsewhere in the zone (as contemplated).

Finally, I note that one representation simply stated "setbacks" as a comment in relation to the proposed development. For the sake of brevity, I refer you and the Development Assessment Commission to my details opinion on the appropriateness of the set backs of the proposal as the "Built Form and Set Backs" section of my Statement (v2 dated 30/4/2017).

In summary, I am of the opinion that the proposal, including condition(s) of consent with respect to Supplemental A, B and C, displays substantial planning merit.

I welcome discussion in relation to my comments, if you so require, otherwise please include a copy of my opinion with your submission to the Development Assessment Commission.

Yours faithfully



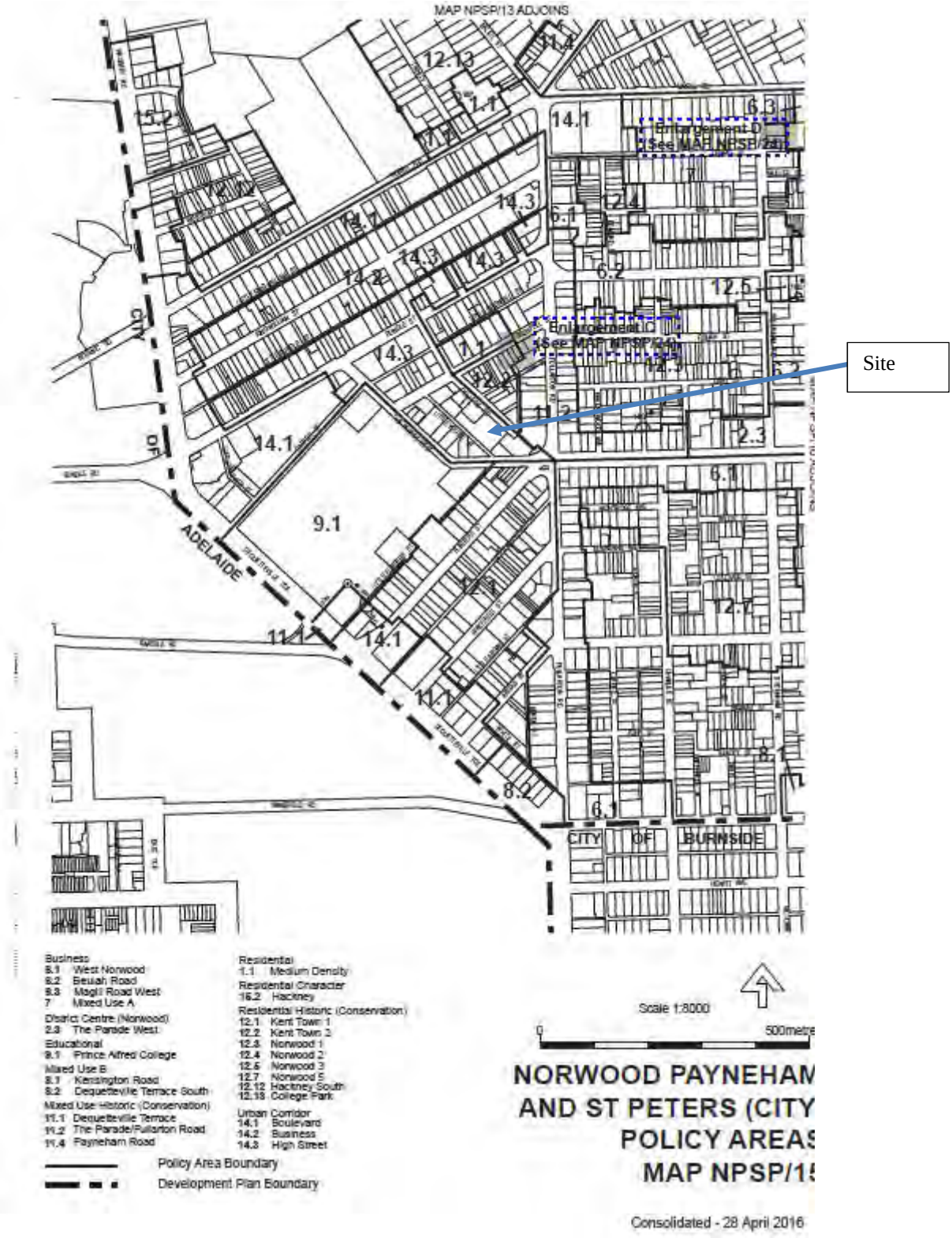
Garth Heynen, MPIA
BA Planning, Grad Dip Regional and Urban Planning, Grad Dip Property

cc. Pruszinski Architects, by email

ATTACHMENT 7: RELEVANT DEVELOPMENT PLAN POLICIES

Norwood, Payneham and St. Peters (City) Development Plan Consolidated 28 April 2016




MAP NPSP/13 ADJOINS
Site
ADELAIDE
CITY OF BURNSIDE
Business
8.1 West Norwood
8.2 Beulah Road
8.3 Magill Road West
7 Mixed Use A
District Centre (Norwood)
2.8 The Parade West
Educational
9.1 Prince Alfred College
Mixed Use B
8.1 Kensington Road
8.2 Dequetteville Terrace South
Mixed Use Historic (Conservation)
11.1 Dequetteville Terrace
11.2 The Parade/Fullarton Road
11.4 Payneham Road
Residential
1.1 Medium Density
Residential Character
16.2 Hackney
Residential Historic (Conservation)
12.1 Kent Town 1
12.2 Kent Town 2
12.3 Norwood 1
12.4 Norwood 2
12.5 Norwood 3
12.7 Norwood 5
12.12 Hackney South
12.13 College Park
Urban Corridor
14.1 Boulevard
14.2 Business
14.3 High Street
Policy Area Boundary
Development Plan Boundary
Scale 1:8000
500metre
NORWOOD PAYNEHAM
AND ST PETERS (CITY
POLICY AREAS
MAP NPSP/15
Consolidated - 28 April 2016

High Street Policy Area

OBJECTIVES

Objective 1: A mix of land uses including retail, office, commercial, community, civic and medium and high density residential development that support the economic vitality of the area.

Objective 2: Buildings sited to provide a continuous and consistent built edge with verandahs/ awnings over the public footpath and an intimate built scale, with fine-grained detailing of buildings in the public realm.

Objective 3: An interesting and varied skyline as viewed from the street and afar, provided by modulation in roof forms and the use of parapets.

Objective 4: An intimate public realm with active streets created by buildings designed with frequently repeated frontage form and narrow tenancy footprints.

Objective 5: A high degree of pedestrian activity and a vibrant street-life with well-lit and engaging shop fronts and business displays including outdoor dining facilities and licensed areas.

Objective 6: Development that contributes to the desired character of the policy area.

DESIRED CHARACTER

The High Street Policy Area will be developed as the retail and pedestrian hub of Kent Town, with a focus on smaller scale specialty shops and businesses, restaurants and cafes, which serve the local community.

The western portion of Rundle Street and The Parade West will form the Primary Road Corridors within the High Street Policy Area, which will be developed with a strong focus on the pedestrian environment and the movement of pedestrians and bicycles between the City and the Eastern suburbs. Except within Area E (shown on Concept Plan Fig UrC/1), which provides greater development opportunities due to the size of the site and the topography of the land, the secondary streets, including Grenfell Street and College Road will provide opportunities for a lower intensity and scale of development than that found along the Primary Road Corridors.

The built form within the High Street Policy Area will establish a rhythm and pattern of facades that support a variety of tenancies with narrow building frontages. The locality will comprise buildings of up to five (5) storeys, with a podium or street wall height of two (2) storeys. Above the podium/street wall component, additional storeys will be set back a minimum of three (3) metres so as to be visually recessive and to maintain a lower-scale feel along the High Street.
Development will enhance the pedestrian environment of Rundle Street, The Parade West and adjacent secondary streets, through the provision of verandahs, pergolas and awnings to provide pedestrian protection and achieve a human scale and visually interesting environment. Where possible, verandahs and pergolas constructed over the footpath will be cantilevered to reduce the possibility of damage by vehicles.

Area E

Area E, shown on Concept Plan Fig UrC/1, provides an opportunity for development of up to five (5) storeys, except along the College Road frontage, where development will be limited to two (2) storeys. Taller building elements will be located within the western portions of the site, where the natural ground level is lower than the eastern portions of the site.
Development will comprise either residential land uses or a mix of commercial and medium to high density residential development. Vehicle access should, where possible, be provided from Little Young Street.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

1 Development should comprise small scale specialty shops and businesses, restaurants and cafes at ground floor levels.

Form and Character

3 Development should be consistent with the desired character for the policy area.

4 Buildings should maintain a pedestrian scale at street level, and should:

(a) include a clearly defined podium or street wall with a maximum building height of 2 storeys or 8 metres in height; and

(b) have levels above the defined podium or street wall setback a minimum of 3 metres from that wall.

5 Pedestrian shelter and shade should be provided over footpaths through the use of structures such as awnings, canopies and verandahs.

6 The ground level street frontages of buildings should contribute to the appearance and retail function of the area by providing at least 5 metres or 60 per cent of the street frontage (whichever is greater) as an entry/foyer or display window to a shop (including a café or restaurant) or other community or commercial use which provides pedestrian interest and activation.

7 The ground floor of buildings should be built to dimensions including a minimum floor to ceiling height of 3.5 metres to allow for adaptation to a range of land uses including retail, office and residential without the need for significant change to the building.

8 A minimum of 50 per cent of the width of ground floor primary frontage of buildings should be visually permeable, transparent or clear glazed to promote active street frontages and maximise passive surveillance.

Urban Corridor Zone

OBJECTIVES

Objective 1: A mixed use zone accommodating a range of compatible non-residential and medium and high density residential land uses orientated towards a high frequency public transport corridor.

Objective 2: Integrated mixed use, medium and high rise buildings with ground floor uses that create active and vibrant streets with residential development above.

Objective 3: A mix of land uses that enable people to work, shop and access a range of services close to home.

Objective 4: Adaptable and flexible building designs that can accommodate changes in land use and respond to changing economic and social conditions.

Objective 5: A built form that provides a transition down in scale and intensity at the zone boundary to maintain the amenity of residential properties located within adjoining zones.

Objective 6: A safe, comfortable and appealing street environment for pedestrians that is sheltered from weather extremes, is of a pedestrian scale and optimises views or any outlook onto spaces of interest.

Objective 7: Noise and air quality impacts mitigated through appropriate building design and orientation.

Objective 8: Development that contributes to the desired character of the zone.

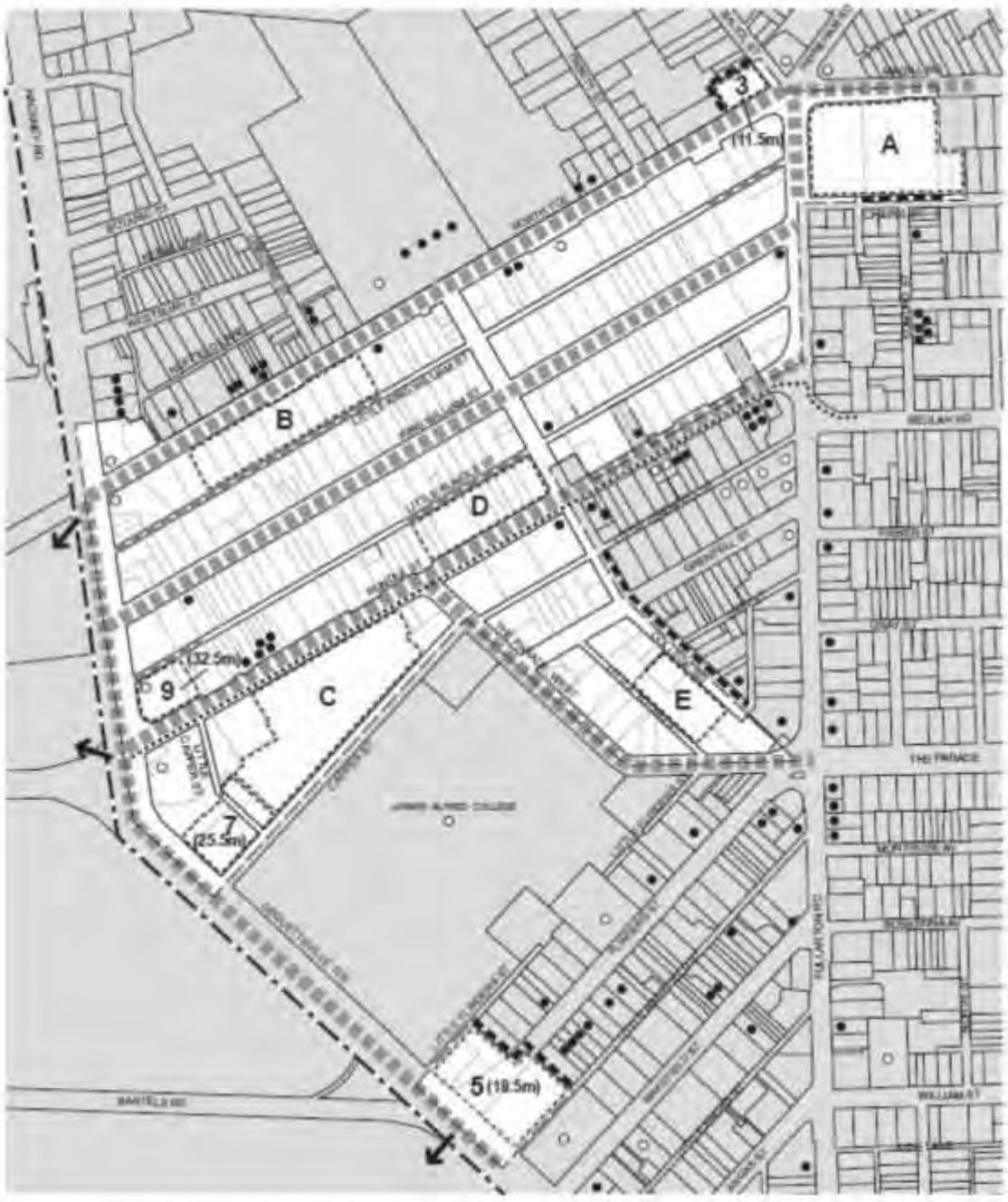
DESIRED CHARACTER

The Urban Corridor Zone supports a mix of compatible non-residential and residential uses at densities which reflect its close proximity to the City of Adelaide and the Adelaide Park Lands, as well as its location around Primary Road Corridors and public transport infrastructure.

Within Kent Town, the Urban Corridor Zone will play a significant role in contributing to the overall population and employment targets for the Eastern Metropolitan Adelaide Region, which are set out in the 30 Year Plan for Greater Adelaide, by providing opportunities for the development of a high quality urban environment, which supports a mix of employment generating activities and medium to high density residential development.

Several Key Development Areas are located throughout the zone and are identified on Concept Plan Fig UrC/1. The Policy Area Desired Character Statements include more detailed land use and built form outcomes for these areas. Development will mostly be focussed along the Primary Road Corridors, including North Terrace, Dequetteville Terrace, King William Street, Rundle Street, The Parade West and small portions of Magill and Fullarton Roads.

Development along the minor streets, including College Road, Capper Street and Grenfell Street, will generally be lower in scale and intensity than development along the Primary Road Corridors.



The important transport function of Dequetteville Terrace as a Primary Freight Route and North Terrace as a Secondary Freight Route, will be maintained to ensure the efficient movement of commercial vehicles around the City of Adelaide and the Inner Metropolitan Area.

Kent Town will continue to be developed as a ‘creative industries hub’ with a focus on digital media, advertising, publishing and design activities. Temporary and permanent art installations on public and private land will be encouraged, to further complement and strengthen this identity.

Along the North Terrace, Hackney Road, Magill Road, Fullarton Road, Rundle Street, The Parade West and King William Street Primary Road Corridors, non-residential land uses should be established at the ground floor levels of buildings. Residential development should only be established above ground floor uses. Along the Dequetteville Terrace Primary Road Corridor, wholly residential buildings are appropriate. On streets not designated as Primary Road Corridors, wholly residential buildings are appropriate.

Wholly commercial buildings are appropriate within the Business Policy Area and may be appropriate in other locations where they do not exceed three levels of commercial space, or on larger sites, where a number of buildings are proposed that can support a mix of land uses.

Where short term residential accommodation (including serviced apartments and tourist accommodation) is located in the same building as longer term residential accommodation, there should be a clear physical separation between these uses (such as allocating lower levels for short term accommodation and upper levels for long term accommodation).

Retail activity will be encouraged on a scale that supports the resident population and business function of Kent Town and where it does not compromise the District Centre function of The Parade.

The zone will primarily support net residential densities of between 60 and 100 dwellings per hectare, with an overall likely yield of an additional 560 dwellings to be achieved by 2040. A minimum residential density target for wholly residential buildings is specified, in order to support the achievement of dwelling yield targets, which align with the *30 Year Plan*. On sites where a mix of residential and non-residential uses is proposed, the average floor area per dwelling should not exceed 100m². It is recognised that not all development sites will have the capacity to contribute to the overall dwelling yield target, due to the fact that development will be required to satisfy a range of design requirements, (such as the provision of on-site car parking, building height and set-backs) which may, particularly on smaller sites, be prohibitive to achieving the desired density outcomes.

Development which incorporates a significant residential component (more than 20 dwellings) will provide a range of dwelling sizes and a proportion of affordable housing.

New development will exhibit architectural merit, which favours contemporary leading edge design, particularly along the prominent Boulevard Policy Area frontages and in gateway locations. Buildings will be designed having regard to best practice energy efficiency principles, in order to reduce dependence on mechanical heating, cooling and lighting systems and include options for the harvest, treatment, storage and reuse of stormwater.

The residential component of all buildings will be designed having regard to the amenity of the occupants and will ensure that individual units have reasonable access to light, ventilation and views. Noise attenuation and air emission control measures will be included in the design of residential units where there is the potential for acceptable noise and air emissions levels to be exceeded. Residential balconies will be designed to form an extension to the main living area and will not be used for the placement of air- conditioning units, the storage of household goods, or unscreened clothes drying areas.

Structures located on the roofs of buildings to house plant and equipment, should be screened with materials that form an integral part of the design, to restrict views of the plant and equipment from the street and from nearby buildings.

Development at the interface with neighbouring zones, will have regard to the potential visual, overlooking and overshadowing impacts on the occupants of adjacent and nearby residential properties. In these locations development will transition down in scale and height towards the periphery of the zone, particularly at the boundaries with the existing Residential and Residential Historic (Conservation) Zones. At other locations within the Urban Corridor Zone, it is recognised that some level of overshadowing and overlooking will occur, however, this will be moderated through a

range of design techniques, which may include separation of buildings, orientation of windows and balconies and various forms of screening.

Development adjacent to, or on the same site as a State or Local Heritage Place, will be respectful of its heritage character and setting and ensure that new development sensitively interfaces with the original building form. This may, in some circumstances, limit the scale and intensity of development on a site.

The prescribed set-backs to the street boundaries may be varied in response to specific site constraints or opportunities, such as the provision of outdoor dining areas, public realm improvements, topography or adjacency to a heritage place. Future road widening requirements along arterial roads are set out in the *Metropolitan Adelaide Road Widening Plan Act 1972.* The siting of new buildings will incorporate the relevant set-back distance required by this Plan.

Some sites within the zone could be contaminated because of previous activities. In this circumstance, development is expected to occur on a precautionary basis, where an assessment should be undertaken to verify that the site is suitable and safe for the intended use, particularly where it involves sensitive uses such as residential development.

Due to the intensity of development expected within the zone, on-site car parking will mostly be provided below grade in the basement of buildings, or at grade or above grade, behind active frontages. Where this occurs, car parking areas and car parking structures should not be visible from the Primary Road Corridors.

Little King William Street and Little Rundle Street will continue to provide vehicular access to the rear of buildings for loading and service requirements or access to car parking areas, however, opportunities to create unique public spaces and activate these laneways should be explored through the development of adjacent land. In this context, the set-back of buildings from the Little King William and Little Rundle Street frontages will provide space for future public realm activities and upgrades.

The provision of on-site vehicle parking will be in accordance with the vehicle parking rates, which have been established for different land uses, however, some opportunity to discount these rates will be considered in circumstances set out in the City Wide principles of development control. In instances where discounted vehicle parking rates are assessed as appropriate for a new development, it is expected that a comparable increase in on-site facilities for bicycle and scooter parking is provided.

Cycling is an increasingly popular form of transport and recreation, therefore development on public and private land will consider the needs of cyclists, in terms of providing secure bicycle parking and storage facilities. Larger scale commercial developments will also provide appropriate end of journey facilities such as showers and change rooms.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

1 The following types of development, or combinations thereof, are envisaged in the zone:

Affordable housing
Aged persons accommodation
Community centre
Consulting room
Dwelling
Educational establishment
Entertainment venue
Hotel
Indoor recreation centre (including health, fitness and personal training facilities)
Licensed premises
Office
Pre-school

Primary school
Residential flat building
Retirement village
Shop or group of shops
Supported accommodation
Tourist accommodation.

2 Development listed as non-complying is generally inappropriate.

Form and Character

3 Development should be consistent with the desired character for the zone.

4 Development should be in accordance with Concept Plan Fig UrC/1.

5 Residential development in a wholly residential building should aim to achieve a target minimum net residential site density in accordance with the following:

Policy Area	Minimum net residential site density
Boulevard	100 dwellings per hectare
High Street	70 dwellings per hectare
Business	no minimum density

6 Vehicle parking should be provided in accordance with the rates set out in Table NPSP/9A - Off Street Vehicle Parking Requirements for Designated Areas.

7 Vehicle parking should be located to the rear of development or not be visible from public land along the primary road frontage.

Design and Appearance

8 Buildings on sites with a frontage width of greater than 10 metres should be well articulated through variations in forms, materials, openings and colours.

9 Buildings should be designed to:

(a) enable suitable sunlight access to public open space; and

(b) overlook or orientate towards public open space and defined pedestrian and cycle routes.

10 To maintain sight lines between buildings and the street, and to improve safety through passive surveillance, solid fencing should not be constructed between the front building line and the primary or secondary street.

11 Development should minimise the number of access points onto an arterial road, by providing vehicle access:

(a) from side streets or rear access ways; or

(b) via co-ordinated through property access rights of way or common rear vehicle parking areas.

12 Vehicle access points on side streets and rear access ways should be located and designed to:

(a) minimise the impacts of headlight glare and noise on nearby residents; and

(b) avoid excessive traffic flows into residential streets.

Building Envelope

Building Height

13 Except where airport building height restrictions prevail, or the interface height provisions require a lesser height, or where an alternative maximum building height is shown on Concept Plan Fig UrC/1, building heights (excluding any rooftop mechanical plant or equipment) should be consistent with the following parameters:

Policy area	Minimum building height	Maximum building height
Boulevard	3 storeys or no less than 11.5 metres, or 4 storeys or no less than 15 metres for land that is directly adjacent to or facing the Adelaide Park Lands	10 storeys and up to 36 metres
High Street	3 storeys or no less than 11.5 metres	5 storeys and up to 18.5 metres
Business	3 storeys or no less than 11.5 metres	5 storeys and up to 18.5 metres

Interface Height Provisions

14 To minimise building massing at the interface with residential development outside of the zone, buildings should be constructed within a building envelope provided by a 30 degree plane, measured from a height of 3 metres above natural ground level at the zone boundary (except where this boundary is a primary road frontage), as illustrated in Figure 1:

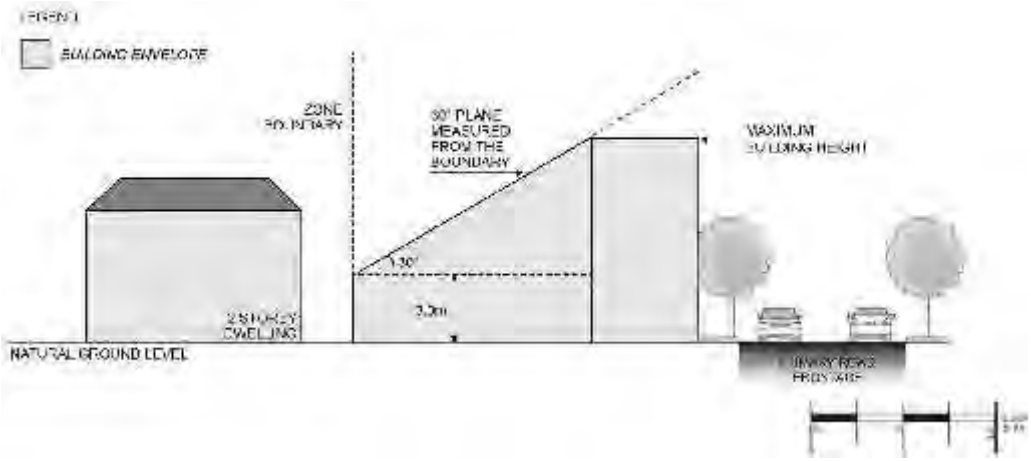


Figure 1

Setbacks from Road Frontages

15 Buildings (excluding verandahs, porticos and the like) should be set back from the primary road frontage in accordance with the following parameters:

Policy Area	Minimum setback from the primary road frontage where it is the Primary Road Corridor as shown on Concept Plan Fig UrC/1.	Minimum setback from the primary road frontage in all other cases
Boulevard Policy Area	4 metres from the Dequetteville Terrace, North Terrace, Magill Road and Fullarton Road Primary Road Corridors	2 metres

Policy Area	Minimum setback from the primary road frontage where it is the Primary Road Corridor as shown on Concept Plan Fig UrC/1.	Minimum setback from the primary road frontage in all other cases
High Street Policy Area	No minimum	2 metres
Business Policy Area	No minimum	2 metres

16 Buildings (excluding verandahs, porticos and the like) should be set back from the secondary road frontage or a vehicle access way in accordance with the following parameters:

Policy area	Minimum setback from a secondary road (where the secondary road is not a rear access way or laneway)	Minimum setback from a rear access way (or laneway)
Boulevard Policy Area	No minimum	1 metre where the access way is 6.5 metres or more in width OR Where the access way is less than 6.5 metres in width, the additional width required to make the access way 6.5 metres, to provide adequate manoeuvrability for vehicles, plus 1 metre
High Street Policy Area	No minimum	1 metre where the access way is 6.5 metres or more in width OR Where the access way is less than 6.5 metres in width, the additional width required to make the access way 6.5 metres, to provide adequate manoeuvrability for vehicles, plus 1 metre
Business Policy Area	No minimum	1 metre where the access way is 6.5 metres or more in width OR Where the access way is less than 6.5 metres in width, the additional width required to make the access way 6.5 metres, to provide adequate manoeuvrability for vehicles, plus 1 metre

Other setbacks

17 Buildings (excluding verandahs, porticos, or any portion of a basement car park which is less than 1 metre above natural ground level) should be set back in accordance with the following parameters:

Policy area	Minimum setback from rear allotment boundary (where not a rear access way or laneway)	Minimum setback from side boundaries (where not a street boundary)
Boulevard Policy Area	5 metres where the subject land directly abuts an allotment of a different zone 3 metres, except where the development abuts the wall of an existing or simultaneously constructed building on the adjoining land.	For allotments with a frontage width of: (a) 20 metres or less: no minimum (b) more than 20 metres: 3 metres
High Street Policy Area	5 metres where the subject land directly abuts an allotment of a different zone 3 metres, except where the development abuts the wall of an existing or simultaneously constructed building on the adjoining land.	No minimum
Business Policy Area	5 metres where the subject land directly abuts an allotment of a different zone 3 metres, except where the development abuts the wall of an existing or simultaneously constructed building on the adjoining land.	No minimum

Non-complying Development

20 The following kinds of development (including combinations thereof, or more than one of a particular kind) are considered inappropriate and are **non-complying** in the Urban Corridor Zone:

Industry (other than light industry or service industry located in the Business Policy Area)
Fuel depot
Petrol filling station
Public service depot
Road transport terminal
Service trade premises
Store
Transport depot
Warehouse (other than where located in the Business Policy Area)
Waste reception storage treatment and disposal

Public Notification

21 The categorisation of development shall be determined by reference to Schedule 9 of the *Development Regulations 2008* and Section 38 of the *Development Act 1993*, except where specifically designated below.

Category 1 Development

The following kinds of development (including combinations thereof, or more than one of a particular kind) are assigned to Category 1 pursuant to Section 38 of the *Development Act 1993*, and accordingly will be subject to the public notification requirements applying to Category 1 development:

Advertisement
Aged persons accommodation

All forms of development that are ancillary and in association with residential development
Consulting room
Dwelling
Educational establishment
Light industry where located within the Business Policy Area
Office
Pre-school Primary
school Residential flat
building Retirement
village
Service industry where located within the Business Policy Area
Supported accommodation
Shop or a group of shops with a gross leasable area of 500 square metres or less where located within the Business Policy Area
Shop or a group of shops with a gross leasable area of 1000 square metres or less where located within the Boulevard and High Street Policy Areas
Warehouse where located in within the Business Policy Area

Category 2 Development
The following development is assigned to Category 2 pursuant to Section 38 of the *Development Act 1993*, and accordingly will be subject to the public notification requirements applying to Category 2 development:

All forms of development not listed as Category 1, other than non-complying development

Any development listed as Category 1 and located on land adjacent to a residential zone that:

(a) is 3 or more storeys in height; or

(b) exceeds the Building Envelope Interface Height Provision.

Council Wide

Design and Appearance of Land and Buildings

OBJECTIVES

Objective 18: The amenity of localities not impaired by the appearance of land, buildings and objects.

Objective 19: Development of a high architectural standard and appearance that responds to and reinforces positive aspects of the local environment and built form.

Objective 20: Architectural excellence allowing for design innovation consistent with sound

Objective 22: A safe, secure and crime resistant environment where land uses are integrated and designed to facilitate community surveillance.

PRINCIPLES OF DEVELOPMENT CONTROL

28 The appearance of land and buildings should not impair the amenity of the locality in which they are situated.

29 Except where the zone or policy area objectives, principles of development control and/or desired character of a locality provide otherwise, new buildings:

(a) may be of a contemporary appearance and exhibit an innovative style;

(b) should complement the urban context of existing buildings on adjoining and nearby land in terms of:

(i) maintenance of existing vertical and horizontal building alignments

(ii) architectural style, building shape and the use of common architectural elements and features;

(iii) consistent colours, materials and finishes; and

(c) should not visually dominate the surrounding locality.

30 Buildings should be designed to minimise their visual bulk and provide visual interest through design elements such as:

(a) articulation;

(b) colour and detailing;

(c) materials, patterns, textures and decorative elements; (d) vertical and horizontal components;

(e) design and placement of windows;

(f) window and door proportions;

(g) roof form and pitch;

(h) verandahs and eaves; and

(i) variations to facades.

31 The design and location of buildings should ensure that adequate natural light is available to adjacent dwellings, with particular consideration given to:

(a) windows of habitable rooms, particularly the living areas of adjacent buildings;

(b) ground-level private open space of adjacent dwellings;

(c) upper level private balconies that provide the primary open space area for any dwelling; and

(d) access to solar energy.

32 The height of buildings, structures and associated component parts should not exceed the number of storeys or height in metres above the natural ground level prescribed in the relevant Zone and/or Policy Area.

For the purposes of this Principle, 'storey' refers to the space between a floor and the next floor above, or if there is no floor above, the ceiling above. A mezzanine floor level shall be regarded as a floor. A space with a floor located below natural ground level shall be regarded as a storey if greater than one metre of the height between the floor level and the floor level above is above natural ground level.

33 Buildings should be designed and sited to avoid creating extensive areas of uninterrupted walls facing areas exposed to public view.

34 Development on corner allotments should:

(a) reinforce the primary and secondary street frontages of the subject site with highly articulated building forms; and

(b) be sited to complement the siting of buildings on the adjacent corner sites.

35 Unless otherwise specified in the relevant Zone and/or Policy Area, where a building is sited on or close to a side boundary, the side boundary wall should be sited and limited in length and height to minimise:

(a) the visual impact of the building as viewed from adjoining properties;

(b) overshadowing of adjoining properties and allow adequate sunlight to neighbouring buildings, private open space and solar collectors (such as solar hot water systems and photovoltaic cells); and

(c) the risk of damage to mature/regulated vegetation on adjoining properties taking into consideration potential damage to the root system.

36 Balconies should:

(a) be integrated with the overall architectural form and detail of the building; (b) be sited to face predominantly north or east to provide solar access;
(c) be self-draining and plumbed to minimise runoff; and

(d) be recessed where wind would otherwise make the space unusable.

37 The external walls and roofs of buildings should not incorporate highly reflective materials which will result in excessive glare.

38 Structures located on the roofs of buildings to house plant and equipment, should be screened from view and should form an integral part of the building design in relation to external finishes, shaping and colours.

39 Building design should emphasise all pedestrian entry points to provide all users with perceptible and direct access from public street frontages and vehicle parking areas.

40 Buildings, landscaping, paving and signage should have a coordinated appearance that maintains and enhances the visual attractiveness of the locality.

41 Buildings (other than ancillary buildings, group dwellings or buildings located on hammerhead, battleaxe or similar configuration allotments) should be designed so that their main facade faces the primary street frontage of the land on which they are situated.

42 Development should be designed and sited so that outdoor storage, loading and service areas, fire escapes and plant and equipment hatches are screened from public view through the use of an appropriate combination of built form, solid fencing and/or landscaping.

43 Outdoor storage, loading and service areas should be located and designed to enable the convenient manoeuvring of service and delivery vehicles and sited away from sensitive land uses.

44 Development should:

(a) protect existing site features, including mature vegetation and trees from damage; and

(b) not result in damage to neighbouring trees.

45 Development in non-residential zones abutting the Residential Zones or the Residential (Historic) Conservation Zones, should not prejudice the attainment of the Objectives relating to the residential zones.

46 Development adjacent to the boundary of a Residential Historic (Conservation) Zone, should provide a transition down in scale and mass to complement the built form within the Residential Historic (Conservation) Zone.

47 Development should not, in respect to its appearance, interfere with the attainment of the Objectives for the relevant Zone or Policy Area or otherwise impact upon the existing character of scenic or environmentally important areas.

48 Outdoor lighting should not result in light spillage on adjacent land.

Crime Prevention

59 Development should be designed to maximise surveillance of public spaces through the incorporation of clear lines of sight, appropriate lighting and the use of visible permeable barriers wherever practicable.

60 Buildings should be designed to overlook public and communal open spaces and streets to allow casual surveillance.

61 Buildings should be designed to minimise and discourage access between roofs, balconies and windows of adjoining dwellings.

62 Development, including car park facilities should incorporate signage and lighting that indicate the entrances and pathways to, from and within the site.

63 Site planning, buildings, fences, landscaping and other features should clearly differentiate between public, communal and private areas.

64 Development should avoid pedestrian entrapment spots and routes and paths that are predictable or unchangeable and offer no choice to pedestrians.

65 Development fronting an alleyway, laneway (including a service lane), or other minor or unserviced street should be located and designed to maximise safety and security.

66 Development fronting a laneway (including a service lane), or other minor or unserviced street should maximise the potential for passive surveillance by ensuring that the building can be seen from nearby buildings and the laneway/minor streets/unserviced streets.

Energy Efficiency

OBJECTIVES

Objective 23: Development designed and sited to conserve energy and minimise waste.

PRINCIPLES OF DEVELOPMENT CONTROL

67 Development should provide for efficient solar access to buildings and open space all year round.

68 Buildings should be sited and designed to ensure:

(a) that the main living areas and the private open space associated with the main living areas, face north to maximise exposure to winter sun; and

(b) adequate natural light and winter sunlight is available to the main internal living areas and principal private open spaces of adjacent properties.

69 Development should be designed to minimise energy consumption by incorporating, where practicable, energy efficient building design elements, techniques and materials, such as:

(a) the sizing, orientation and shading of windows to reduce summer heat load and take advantage of winter sun;

(b) the use of deciduous trees, pergolas, eaves, verandas and awnings, to allow penetration of heat and light from the sun in winter and to provide shade in summer;

(c) openings designed to maximise the potential for natural cross-ventilation to enable cooling breezes to reduce internal temperatures in the summer months; or

(d) the use of colours on external surfaces such as roofs and walls, to minimise heat absorption in summer.

Landscaping, Fences and Walls

OBJECTIVES

Objective 24: The amenity of land and development enhanced with appropriate planting and landscaping, which uses locally indigenous plant species where possible.

Objective 25: Functional fences and walls that enhance the attractiveness of development.

PRINCIPLES OF DEVELOPMENT CONTROL

Landscaping

73 Development should incorporate open space and landscaping and minimise the use of hard paved surfaces in order to:

(a) complement built form and reduce the visual impact of larger buildings (for example locating taller and broader plants against taller and bulkier building components);

(b) enhance the visual appearance from the street frontage;

(c) screen service yards, loading areas and outdoor storage areas;

(d) define and enhance the appearance of outdoor spaces, including car parking areas;

(e) minimise heat absorption and reflection;

(f) provide shade and shelter;

(g) assist in climate control within and around buildings;

(h) allow for natural infiltration of surface waters through permeable treatments;

(i) contribute to the viability of ecosystems and species; and

(j) promote water and biodiversity conservation.

74 Landscaped areas should:

(a) where practicable, have a width of not less than two metres;

(b) be protected from damage by vehicles and pedestrians;

(c) result in the appropriate clearance from powerlines and other infrastructure being maintained;

(d) be designed to incorporate the re-use of stormwater for irrigation purposes; and

(e) include the planting of locally indigenous species where practical.

75 Landscaping should be used to assist in discouraging crime by:

(a) screen planting areas susceptible to vandalism;

(b) planting trees or ground covers, rather than shrubs, alongside footpaths; and

(c) planting vegetation other than ground covers a minimum distance of two metres from footpaths to reduce concealment opportunities.

76 Landscaping of non-residential development should be provided and maintained in order to:

(a) establish a buffer between the non-residential development and the development on adjacent sites;

(b) complement the landscaping provided by adjacent development and enhance the visual appearance and character of the area;

(c) shade, define and create windbreaks for pedestrian paths and spaces;

(d) screen, shade and enhance the appearance of car parking areas;

(e) screen service yards, loading areas and outdoor storage areas; and

(f) re-establish local indigenous plant species where it is practical to do so.

77 Non-residential development adjacent to a residential land use or zone or within a residential zone, should incorporate landscaping which includes plants of a mature height, scale and form.

78 Landscaping should not:

(a) unreasonably restrict solar access to adjoining development;

(b) cause damage to buildings, paths, infrastructure/services and other landscaping from root invasion, soil disturbance or plant overcrowding;

(c) remove opportunities for passive surveillance;

(d) increase leaf fall into watercourses; and

(e) introduce pest plants and/or increase the risk of weed invasion.

Fences and Walls

79 Fences and walls, including retaining walls, should:

(a) not result in damage to neighbouring trees;

(b) be compatible with the associated development and with existing predominant, attractive fences and walls in the locality;

(c) enable some visibility of buildings from and to the street or laneway (only where it is the primary street) to allow casual surveillance;

(d) incorporate articulation or other detailing, where there is a large expanse of wall facing the street;

(e) assist in highlighting building entrances;

(f) be sited and limited in height, to ensure adequate sight lines for motorists and pedestrians especially on corner sites;

(g) in the case of side and rear boundaries, be of sufficient height to maintain privacy and/or security without adversely affecting the visual amenity or access to sunlight of adjoining land; and

(h) be constructed of non-flammable materials.

Interface Between Land Uses

OBJECTIVES

Objective 26: Development located and designed to minimise adverse impact and conflict between land uses.

Objective 27: Protect community health and amenity from the adverse impacts of development and support the continued operation of all desired land uses.

PRINCIPLES OF DEVELOPMENT CONTROL

80 Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:

(a) the emission of effluent, odour, smoke, fumes, dust or other airborne pollutants;

(b) noise;

(c) vibration;

(d) electrical interference;

(e) light spill;

(f) glare;

(g) hours of operation; or

(h) traffic impacts.

81 Residential development adjacent to a non-residential land use or zone or within a non-residential zone should be located, designed and sited in a manner which:

(a) protects residents from any adverse effects of non-residential activities; and

(b) minimises negative impact on existing and potential future land uses considered appropriate in the locality.

82 Non-residential development in residential zones should:

(a) not detrimentally impact on the amenity of nearby residents;

(b) provide adequate protection for residents of adjoining sites from air and noise pollution, traffic disturbance and other harmful effects on health or amenity; and

(c) not negatively impact on adjoining open space, mature trees or vegetation.

83 Non-residential development adjacent to a residential zone or within a residential zone should be located, designed and sited to minimise overlooking and overshadowing of nearby residential properties.

84 Non-residential development on land abutting a residential zone or within a residential zone should be designed to minimise noise impacts and achieve adequate levels of compatibility between existing and proposed uses.

85 Sensitive land uses which are likely to conflict with the continuation of lawfully existing developments and land uses considered appropriate for the zone should not be developed.

Movement, Transport and Car Parking

OBJECTIVES

The main elements of the transport system are shown on Map NPSP/1 (Overlay 1) Parts A & B.

Objective 28: A comprehensive, integrated and efficient public and private transport system which will:

(a) provide access to adequate transport services for all people, at an acceptable cost;

(b) effectively support the economic development of metropolitan Adelaide and the State;

(c) ensure a high level of safety; and

(d) maintain the options for the introduction of suitable new transport technologies.

Objective 29: A road hierarchy to form the basis of development controls and serve as a guide to the investment of road funds in order to ensure a safe and efficient traffic flow and to promote the saving of fuel and time. Arterial roads will provide for major traffic movements.

Objective 30: A safe, convenient and clearly defined network of roads, paths and tracks throughout the City that also links to networks beyond the City and accommodates a variety of vehicular, cycle and pedestrian traffic.

Objective 31: A compatible arrangement between land uses and the transport system which will:

(a) ensure minimal noise and air pollution;

(b) protect amenity of existing and future land uses;

(c) provide adequate access; and

(d) ensure maximum safety.

Objective 32: A form of development adjoining main roads which will:

(a) ensure traffic can move efficiently and safely;

(b) discourage commercial ribbon development;

(c) prevent large traffic-generating uses outside designated shopping/centre zones;

(d) provide for adequate off-street parking; and

(e) provide limited and safe points of access and egress.

Objective 33: Control of the movement of traffic according to a defined hierarchy of roads which seeks to improve safety and to limit the speed and volume of traffic in local residential streets without unreasonably restricting access opportunities.

Objective 34: Development which provides adequate and safe car parking appropriate to the demands generated.

Objective 35: Provision of an effective public transport system to facilitate travel to, from and within the City.

PRINCIPLES OF DEVELOPMENT CONTROL

Land Use

92 Land uses arranged to support the efficient provision of sustainable transport networks and encourage their use.

Movement Systems

93 Development should be integrated with existing transport networks, particularly major rail, road and public transport corridors, and designed to minimise its potential impact on the functional performance of the transport network.

94 Transport corridors should be sited and designed so as to not unreasonably interfere with the health and amenity of adjacent sensitive land uses.

95 Land uses that generate large numbers of visitors such as shopping centres, places of employment, schools, hospitals and medium to high density residential uses should be located so that they can be serviced by the public transport network and encourage walking and cycling.

96 Development generating high levels of traffic, such as schools, shopping centres and other retail areas, and entertainment and sporting facilities should incorporate passenger pick-up and set-down areas. The design of such areas should minimise interference to existing traffic and give priority to pedestrians, cyclists and public and community transport users.

97 The location and design of public and community transport set-down and pick-up points should maximise safety and minimise the isolation and vulnerability of users.

98 Development should provide safe and convenient access for all anticipated modes of transport.

99 Development at intersections, pedestrian and cycle crossings, and crossovers to allotments should maintain or enhance sightlines for motorists, cyclists and pedestrians to ensure safety for all road users and pedestrians.

100 Driveway crossovers affecting pedestrian footpaths should maintain the level and surface colour of the footpath.

101 Driveway crossovers should be appropriately separated and the number minimised to maintain streetscape character, preserve street trees and optimise the provision of on-street visitor parking (where on-street parking is appropriate).

102 Development should be designed to discourage commercial and industrial vehicle movements through residential streets and adjacent other sensitive land uses.

103 Industrial/commercial vehicle movements should be separated from passenger vehicle car parking areas.

104 Development should include appropriate on-site provision to enable the parking, loading, unloading, turning and fuelling of vehicles.

Access

112 Development should have direct access from an all-weather public road.

113 Development should be provided with safe and convenient access which:

(a) avoids unreasonable interference with the flow of traffic on adjoining roads;

(b) provides appropriate separation distances from existing roads or level crossings;

(c) accommodates the type and volume of traffic likely to be generated by the development or land use and minimises induced traffic through over-provision; and

(d) is sited and designed to minimise any adverse impacts on the occupants of and visitors to neighbouring properties.

114 Development should not restrict access to publicly owned land such as recreation areas.

115 On-site parking and manoeuvring areas servicing development abutting arterial roads should be designed to enable all vehicles to enter and exit the site in a forward direction.

117 Driveways and parking areas should be designed and constructed to:

(a) follow the natural contours of the land;

(b) minimise excavation and/or fill;

(c) minimise the potential for erosion from surface runoff;

(d) avoid the removal of existing vegetation, including street trees; and

(e) be consistent with Australian Standard AS: 2890 – Parking facilities.

118 Driveways should:

(a) not exceed a gradient of 1 in 5 at any point and have a near level gradient (of 1 in 20) at either end for a length of at least 5 metres and connect to any existing paved footpath surface at a level that does not require any modification to the level of any public infrastructure;

(b) be designed, located and constructed in a manner which enables safe and convenient access, with surfaces providing adequate traction for the wheels of vehicles; and

(c) be designed and located so that they are not constructed closer than 1.5 metres to any street tree.

Access for People with Disabilities

119 Development should be sited and designed to provide convenient access for people with a disability.

Vehicle Parking

120 Development should provide off-street vehicle parking in accordance with rates contained in Tables NPSP/8 and 9.

121 Development in the nature of additions to existing non-residential premises should provide on-site car parking in accordance with the principles of development control to serve new floor area while maintaining existing car parking numbers for the existing floor area.

122 **A** lesser on-site car parking rate may be applied to applicable elements of a development in any of the following circumstances:

(a) development includes affordable housing or student accommodation; or

(b) sites are located within 200 metres walking distance of a convenient and frequent service fixed public transport stop; or

(c) mixed use development including residential and non-residential development has respective peak demands for parking occurring at different times; or

(d) the proposed development is on or adjacent to the site of a heritage place, or includes retention of a desired traditional building and its features, which hinders the provision of on-site parking or the most effective use of the spaces within the site; or

(e) the parking shortfall is met by contribution to a Car Parking Fund (where one is available); or

(f) the development qualifies for certification under the Green Energy rating program, or similar program; or

(g) where it can be demonstrated that it would not result in a greater demand for on-street car parking on existing streets in the locality.

123 Development should provide carparking which is consistent with *Australian Standard AS: 2890 - Parking facilities*.

124 Vehicle parking areas should be sited and designed to:

(a) facilitate safe and convenient pedestrian linkages to the development and areas of significant activity or interest in the vicinity of the development;

(b) include safe pedestrian and bicycle linkages that complement the overall pedestrian and cycling network;

(c) not inhibit safe and convenient traffic circulation;

(d) result in minimal conflict between customer and service vehicles;

(e) avoid the necessity to use public roads when moving from one part of a parking area to another;

(f) minimise the number of vehicle access points onto public roads;

(g) avoid the need for vehicles to reverse onto public roads;

(h) where practical, provide the opportunity for shared use of car parking and integration of car parking areas with adjoining development to reduce the total extent of vehicle parking areas and the requirement for access points;

(i) not dominate the character and appearance of the development when viewed from public roads or spaces;

(j) provide landscaping that will shade and enhance the appearance of the vehicle parking areas; and

(k) where practicable, include infrastructure such as underground cabling and connections to power infrastructure that will enable the recharging of electric vehicles.

125 Where vehicle parking areas are not obviously visible or navigated, signs indicating the location and availability of vehicle parking spaces associated with businesses should be displayed at locations readily visible to users.

126 Vehicle parking areas that are likely to be used during non-daylight hours should provide floodlit entry and exit points and site lighting directed and shaded in a manner that will not cause nuisance to adjacent properties or users of the parking area.

127 Vehicle parking areas should be sealed or paved to minimise dust and mud nuisance.

128 To assist with stormwater detention and reduce heat loads in summer, outdoor vehicle parking areas should include landscaping.

129 Vehicle parking areas should be line-marked to delineate parking bays, movement aisles and direction of traffic flow.

130 On-site visitor parking spaces should be sited and designed to:

(a) not dominate internal site layout;

(b) be clearly defined as visitor spaces not specifically associated with any particular dwelling; and

(c) be accessible to visitors at all times.

Vehicle Parking for Mixed Use and Corridor Zones

131 Loading areas and designated parking spaces for service vehicles should:

(a) be provided within the boundary of the site; and

(b) not be located in areas where there is parking provided for any other purpose.

132 Vehicle parking spaces and multi-level vehicle parking structures within buildings should:

(a) enhance active street frontages by providing land uses such as commercial, retail or other non-car park uses along ground floor street frontages;

(b) complement the surrounding built form in terms of height, massing and scale; and

(c) incorporate facade treatments along major street frontages that are sufficiently enclosed and detailed to complement neighbouring buildings consistent with the desired character of the locality.

133 In mixed use buildings, the provision of vehicle parking may be reduced in number and shared where the operating hours of commercial activities complement the residential use of the site.

Stormwater Management

OBJECTIVES

Objective 42: Development sited and designed to maximise the harvest and use of stormwater and reduce run-off.

Objective 43: Development sited and designed to minimise demand on reticulated water supplies.

Objective 44: Development designed and located to protect stormwater from pollution sources.

Objective 45: Development designed and located to protect or enhance the environmental values of receiving waters.

Objective 46: Development sited and designed to prevent or minimise the risk of downstream flooding.

Objective 47: Development designed and located to prevent erosion.

Objective 48: Storage, use and disposal of stormwater which avoids adverse impact on public health and safety.

PRINCIPLES OF DEVELOPMENT CONTROL

147 Development should be designed to maximise conservation, minimise consumption and encourage re-use of water resources.

148 Development should be sited and designed to:

(a) minimise surface water runoff;

(b) capture and re-use stormwater, where practical;

(c) prevent soil erosion and water pollution;

(d) protect and enhance natural water flows;

(e) protect water quality by providing adequate separation distances from watercourses and other water bodies; and

(f) maintain natural hydrological systems and not adversely affect:

(i) the quantity and quality of groundwater; and

(ii) the depth and directional flow of groundwater.

149 Development should include stormwater management systems to:

(a) mitigate peak flows and manage the rate and duration of stormwater discharge from the site to ensure the carrying capacities of downstream systems are not overloaded; and

(b) protect it from damage during a minimum of a 1 in 100 year Average Recurrence Interval flood.

150 Stormwater management systems should preserve natural drainage systems, including the associated environmental flows.

151 Stormwater management systems should:

(a) maximise the potential for stormwater harvesting and re-use, either on-site or as close as practicable to the source; and

(b) utilise, but not be limited to, one or more of the following harvesting methods:

(i) the collection of roof water in tanks;

(ii) the controlled discharge to open space, landscaping or garden areas, including strips adjacent to car parks;

(iii) the incorporation of detention and retention facilities; or

(iv) aquifer storage and recovery.

152 Stormwater management systems should be designed and located to improve the quality of stormwater, minimise pollutant transfer to receiving waters, and protect downstream receiving waters from high levels of flow.

153 Development affecting, or likely to affect, existing stormwater management systems should be designed and located to improve the quality of stormwater, minimise pollutant transfer to receiving waters, and protect downstream receiving waters from high levels of flow.

154 Development should incorporate appropriate measures to minimise the concentrated discharge of stormwater from the site.

155 Site drainage should:

(a) include, where practicable, scope for on-site stormwater detention, retention and use, including the collection and storing of water from roofs and communal car parks in appropriate devices;

(b) provide for on-site infiltration where practicable, having regard to:

(i) the availability of unbuilt upon or unsealed areas;

(ii) the ability of the soils to absorb water;

(iii) the ability of the building footings on and adjacent to the site to withstand the likely effects of any retained water; and

(iv) any potential adverse impacts on the level of ground water in the locality;

(c) allow for convenient access to all components of the drainage system for maintenance purposes; and

(d) not cause damage or nuisance flows on site or to adjoining properties.

159 All new dwellings and additions to existing dwellings (including dependent accommodation units) greater than 50 square metres (where the addition incorporates a water closet, water heater or a laundry cold water outlet) with direct access to the ground level, should be provided with a 2000 litre rainwater tank/s connected to the roof water outlets and plumbed to at least a water closet, a water heater and/or all laundry cold water outlets.

160 A development which includes:

(a) three or more dwellings;

(b) the replacement of one dwelling with three or more dwellings on one site, or on separate sites resulting from the land division of the original site; or

(c) in the case of a non-residential development, an impervious surface area that is greater than the pre-development state;

should incorporate an on-site stormwater detention system (either above or below ground) to ensure that stormwater discharged from the site and/or combined sites does not exceed the capacity of the existing or planned 1 in 5 year Average Recurrence Interval stormwater system and increase the risk of flooding to downstream properties or add any significant pollutant load to the downstream stormwater system.

161 Where it is not practicable to detain or dispose of stormwater on site, only clean stormwater runoff should enter the public stormwater drainage system.

162 Water discharge from a site should be of a physical, chemical and biological condition equivalent to or better than the water discharge from the site in its pre-developed state.

163 Stormwater from a site should not discharge into or onto a laneway (including a service lane), or other minor or unserviced street unless there is a defined underground piped stormwater drainage system which has sufficient capacity to receive the stormwater flows.

164 A dwelling, other than a dwelling located within the 1-in-100 year Average Recurrence Interval floodplain, should be sited and designed so that the finished floor level of the dwelling is a suitable height above the adjacent top of kerb level, to enable the efficient gravity-fed drainage of

stormwater from all impervious surfaces on the site, provided that the finished floor level of the dwelling is no more than 700 millimetres above the natural ground level at any point along the side and rear boundaries of the site.

In instances where this can not be achieved, a lower floor level and alternative stormwater management system, such as pump and sump and/or soakage systems, should be provided. This alternative stormwater management system should take into consideration the secondary flood flows from the road reserve and provide adequate mitigation measures.

165 Development should incorporate appropriate measures to minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria and litter and other contaminants to the stormwater system and may incorporate systems for treatment or use on site.

Residential Development

OBJECTIVES

Objective 55: Safe, pleasant, convenient, and healthy-living environments that meet the full range of needs and preferences of the community.

Objective 56: An increased mix in the range and number of dwelling types available within the City to cater for changing demographics, particularly smaller household sizes, housing for seniors and supported accommodation.

Objective 57: Increased dwelling densities in areas close to centres, public transport and significant public open spaces.

PRINCIPLES OF DEVELOPMENT CONTROL

General

174 Residential development should efficiently use infrastructure and services.

175 Residential development should not create conditions which are likely to exceed the capacity of existing roads, public utilities and other community services and facilities.

176 Residential development should be appropriately designed to take into account the climatic and topographic conditions of the site.

177 Residential development should minimise the potential for personal and property damage arising from natural hazards including landslips, bushfires and flooding.

179 All dwellings should have frontage to a road but not including a lane shown on Map NPSP/1 (Overlay 4).

Residential Character and Identity

180 Residential development adjacent to a Residential Historic (Conservation) Zone, should form a transition between the Residential Historic (Conservation) Zone and the adjacent Zone and should be of a bulk and scale that complements the built form within the Residential Historic (Conservation) Zone.

181 Residential development should minimise the impact of driveways and garaging on the character of the existing streetscapes and maximise opportunity for soft landscaping.

182 Multi-unit development (greater than 10 dwellings) on large sites should address both the public and private realm through the inclusion of public art, good urban design and landscape features.

183 Non-residential development in a residential zone should be of a nature and scale that does not detrimentally affect the character or the amenity of the locality as a place in which to live.

184 No more than half of the open space (the area excluding all buildings and structures) around:

(a) a dwelling located on a battleaxe allotment, hammerhead allotment or an allotment of a similar configuration;

(b) a residential flat building; or

(c) group dwellings;

should be used for uncovered car parking, vehicle manoeuvring areas and driveways.

193 Dwellings should be designed and sited to minimise the impact of the building's bulk when viewed from the private open space of adjacent sites by:

(a) increasing setbacks on upper levels of buildings in order to achieve greater separation from neighbouring private open space; and

(b) using articulation, colour, materials and detailing.

194 All habitable rooms should have at least one window with a minimum horizontal distance, between any facing building and the face of the wall containing the window (ie the distance between the eaves, fascias or gutters), of no less than 900 millimetres which is clear to the sky (Refer to Figure 7).

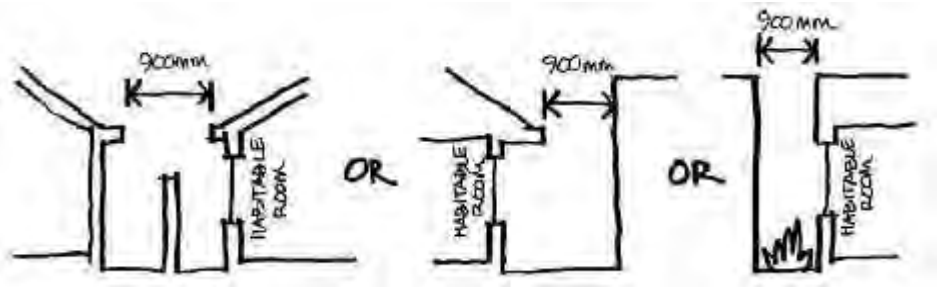


Figure 7

195 Unless otherwise specified in the relevant Zone and/or Policy Area, development should ensure that the north-facing windows of habitable rooms of dwelling(s) on adjacent sites receive at least 3 hours of direct sunlight over a portion of their surface and in the case of the main living area windows, a minimum of 50% of their surface, between 9am and 5pm on the winter solstice (21 June).Development should not increase the overshadowed area in cases where overshadowing from existing structures, fences and non-deciduous vegetation already exceeds this requirement.

196 Unless otherwise specified in the relevant Zone and/or Policy Area, development should ensure that at least half of the ground level private open space of existing dwelling(s) receive direct sunlight for a minimum of two hours between 9.00am and 3.00pm on 21 June. Development should not increase the overshadowed area in cases where overshadowing already exceeds these requirements.

197 The design of residential flat buildings (except residential flat buildings in the form of apartments in a multi-storey building) should define individual dwellings in the external appearance of the building.

198 Driveway crossovers should be single width, appropriately separated, and the number minimised to maintain streetscape character, preserve street trees and optimise the provision of on-street visitor parking.

200 On-site visitor parking spaces for group dwellings, multiple dwellings and residential flat buildings should be located and designed to:

(a) not dominate the internal site layout;

(b) not dominate the streetscape appearance;

(c) be clearly defined as visitor spaces not specifically associated with any particular dwelling; and

(d) ensure they are not sited behind locked garage doors, gates or fences and are accessible to visitors at all times.

206 Unless otherwise specified in the relevant Zone and/or Policy Area, the set-back of dwellings from their side and rear boundaries should be progressively increased as the height of the building increases:

(a) to minimise the visual impact of the building from adjoining properties;

(b) to minimise the overshadowing of adjoining properties;

(c) to ensure adequate natural light and winter sunlight is available to the main activity areas and private open space of adjacent dwellings.

Site Coverage

208 Site coverage should ensure that sufficient space is provided for:

(a) front, side and rear boundary setbacks that contribute to the desired character of the area;

(b) the required level of private open space and landscaping;

(c) pedestrian and vehicle access and vehicle parking;

(d) domestic storage;

(e) outdoor clothes drying;

(f) rainwater tank; and

(g) convenient storage of household waste and recycling receptacles.

220 Residential development should incorporate soft landscaping of a scale and intensity to offset built form and to reinforce the established garden and mature tree lined character of the City.

221 The landscaping of development in residential zones should:

(a) enhance residential amenity;

(b) screen storage, service and parking areas;

(c) provide protection from sun and wind;

(d) not unreasonably affect adjacent land by shadow; and

(e) preferably incorporate the use of local indigenous plant species.

Communal Open Space

231 Communal open space should be shared by more than one dwelling, not be publicly accessible and exclude:

(a) private open space;

(b) public rights of way;

(c) private streets;

(d) parking areas and driveways;

(e) service and storage areas; and

(f) narrow or inaccessible strips of land.

232 Communal open space should only be located on elevated gardens or roof tops where the area and overall design is useful for the recreation and amenity needs of residents and where it is designed to:

(a) address acoustic, safety, security and wind effects;

(b) minimise overlooking into habitable room windows or onto the useable private open space of other dwellings;

(c) facilitate landscaping and/or food production; and

(d) be integrated into the overall facade and composition of buildings.

Site Facilities and Storage

233 Site facilities for group dwellings and residential flat buildings of greater than six dwellings should include:

(a) mail box facilities located close to the major pedestrian entrance to the site;

(b) bicycle parking for residents and visitors;

(c) household waste and recyclable material storage areas away from dwellings; and

(d) external clothes drying areas, which are readily accessible to each dwelling and complement the development and streetscape character, for dwellings which do not incorporate ground level private open space.

Visual Privacy

234 In areas where buildings of 3 or more storeys are contemplated, direct overlooking into habitable room windows or onto the useable private open spaces of other dwellings from upper level windows, external balconies, terraces and decks should be minimised through the adoption of one or more of the following methods and may be supplemented by landscaping:

(a) building layout;

(b) location and design of windows and balconies;

(c) screening devices; or

(d) adequate separation.

235 Except where buildings of three or more storeys are contemplated within the Urban Corridor Zone and the District Centre (Norwood) Zone, in all other circumstances upper level windows, balconies, terraces and decks should:

(a) have a sill height of not less than 1.7 metres above the finished floor level (Refer to Figure 10); or

(b) be treated with permanently fixed obscured treatment (such as glazing or adhesive film) in the part of the window below 1.7 metres above the finished floor level (Refer to Figure 10); or

(c) be permanently screened to a height of not less than 1.7 metres above the finished floor level, through the use of external screening devices, such as planter boxes and angled louvres (Refer to Figure 10); and

(d) in the case of balconies, not exceed 15 square metres in floor.

236 Permanently fixed external screening devices should be designed and finished in materials to blend in with the associated building's external materials and finishes.

Noise

237 Residential development close to high noise sources (eg major roads, O-bahn, and industry) should be designed to locate bedrooms, living rooms and private open spaces away from those noise sources, or protect these areas with appropriate noise attenuation measures.

238 Residential development on sites abutting established collector or higher order roads should include front fences, walls and landscaping that will supplement the noise control provided by the building facade.

239 The number of dwellings sharing a common internal pedestrian entry within a residential flat building should be minimised to limit noise generation in internal access ways.

240 External noise and light intrusion to bedrooms should be minimised by separating or shielding these rooms from:

(a) active communal recreation areas, parking areas and vehicle access ways; and

(b) service equipment areas on the same or adjacent sites.

241 Bedroom windows should be located at least 3 metres from a street carriageway, a communal parking area or an active communal recreation area. A reduced setback of no less than 1.5 metres may be considered where there is an intervening solid fence of at least 1.8 metres in height, or where the window sill is a minimum of 1.5 metres above the level of the carriageway or recreation area (Refer to Figure 11).

Figure 11

242 Noise generated by fixed noise sources such as air conditioning units and pool pumps should be located, designed and attenuated to avoid causing potential noise nuisance to adjoining landowners and occupiers.

Safety and Security

243 Residential developments and associated spaces should be designed to enhance safety and security by:

(a) ensuring dwellings overlook public and communal streets and public open spaces to allow casual surveillance;

(b) avoiding heavily obscured or isolated spaces that potentially expose residents to threat in their usual movements to and from home e.g. by providing convenient and safe access from car parking spaces to entry doors;

(c) providing clear lines of sight and appropriate lighting;

(d) clearly differentiating public, communal and private areas through the use of low front fences or other visual treatments; and

(e) making the public realm attractive to general foot traffic and casual surveillance throughout various times of the day.

244 Residential development should:

(a) not have a significant adverse effect on safety and amenity due to the generation of through traffic;

(b) provide for the safe and efficient movement of vehicles;

(c) provide for the safe and convenient movement for pedestrians and cyclists;

(d) provide for easy access for emergency and essential service vehicles;

(e) where practical, separate pedestrian and vehicular movements by incorporating separate paths or at the very least different surface materials; and

(f) be designed to minimise the adverse effects of adjacent traffic movement.

Medium and High Rise Development (3 or More Storeys)

OBJECTIVES

Objective 60: Medium and high rise development that provides housing choice and employment opportunities.

Objective 61: Residential development that provides a high standard of amenity and adaptability for a variety of accommodation and living needs.

Objective 62: Commercial, office and retail development that is designed to create a strong visual connection to the public realm and that contributes to the vitality of the locality.

Objective 63: Buildings designed and sited to be energy and water efficient.

PRINCIPLES OF DEVELOPMENT CONTROL

Design and Appearance

260 Buildings should:

(a) achieve a human scale at ground level through the use of elements such as canopies, verandahs or building projections;

(b) provide shelter over the footpath where minimal setbacks are desirable; and

(c) ensure walls on the boundary that are visible from public land include visually interesting treatments to break up large blank facades.

261 The ground floor level of buildings (including the foyer areas of residential buildings) should be designed to enable surveillance from public land to the inside of the building at night.

262 Entrances to multi-storey buildings should:

(a) be oriented towards the street;

(b) be clearly identifiable;

(c) provide shelter, a sense of personal address and transitional space around the entry; and

(d) provide separate access for residential and non-residential land uses.

Visual Privacy

263 The visual privacy of ground floor dwellings within multi-storey buildings should be protected through the use of design features such as the elevation of ground floors above street level, setbacks from the street and the location of verandahs, windows, porticos or the like.

Building Separation and Outlook

264 Residential buildings (or the residential floors of mixed use buildings) should:

(a) have adequate separation between habitable room windows and balconies from other buildings to provide visual and acoustic privacy for dwelling occupants and allow the infiltration of daylight into interior and outdoor spaces; and

(b) ensure living rooms have, at a minimum, a satisfactory short range visual outlook to public or communal space.

Dwelling Configuration

265 Buildings comprising more than 20 dwellings should provide a variety of dwelling sizes and a range in the number of bedrooms per dwelling.

266 Dwellings with three or more bedrooms located on the ground floor of medium and high rise buildings should, where possible, have the windows of habitable rooms overlooking internal courtyard space or other public space.

Adaptability

267 Multi-storey buildings should include a variety of internal designs that will facilitate adaptive reuse.

Environmental

268 Multi-storey buildings should:

(a) minimise detrimental micro-climatic and solar access impacts on adjacent land or buildings, including effects of patterns of wind, temperature, daylight, sunlight, glare and shadow; and

(b) incorporate roof designs that enable the provision of rain water tanks (where they are not provided elsewhere), photovoltaic cells and other features that enhance sustainability.

269 Green roofs (which can be a substitute for private or communal open space provided they can be accessed by occupants of the building) are encouraged on all new residential, commercial or mixed use buildings.

270 Development of five or more storeys, or 18.5 metres or more in building height (excluding the rooftop location of mechanical plant and equipment), should be designed to minimise the risk of wind tunnelling effects on adjacent streets by adopting one or more of the following:

(a) a podium at the base of a tall tower which is aligned with the street to deflect wind away from the street;

(b) substantial verandahs around a building to deflect downward travelling wind flows over pedestrian areas; or

(c) the placement of buildings and use of setbacks to deflect the wind at ground level.

Site Facilities and Storage

271 Each dwelling within a multi-storey building should provide a covered storage area of not less than 8 cubic metres in one or more of the following areas:

(a) in the dwelling (but not including a habitable room);

(b) in a garage, carport or outbuilding; or

(c) within an on-site communal facility.

272 The design of driveway crossovers, parking areas, accessways and elements that interact with the public realm should safely and efficiently accommodate the collection of waste and recycling materials.

273 Development should provide a dedicated area for the on-site storage, collection and sorting of recyclable materials and waste that is consistent with the following:

(a) easily and safely accessible to the collection point;

(b) easily and safely accessible to residents and collection service providers;

(c) well screened to prevent vandalism and theft; and

(d) designed to reduce odour and discourage vermin.

274 Development with a gross floor area of 2000 square metres or more should provide for the communal storage, collection and management of waste.

OVERLAYS

Affordable Housing Overlay

The following policies apply to the 'designated area' shown on Overlay Map NPSP/1 (Overlay 6) Affordable Housing.

Where the Objectives and/or Principles of Development Control that apply in relation to this overlay are in conflict with the relevant General Objectives and/or Principles of Development Control in the Development Plan, the overlay will prevail.

OBJECTIVES

Objective 1: Affordable housing that is integrated into residential and mixed use development.

Objective 2: Development that comprises a range of affordable dwelling types that caters for a variety of household structures.

PRINCIPLES OF DEVELOPMENT CONTROL

1 Development comprising 20 or more dwellings should include a minimum of 15 per cent affordable housing (as defined by the *South Australian Housing Trust Regulations 2010* as

amended), unless it can be demonstrated that any shortfall in affordable housing from a preceding stage of development will be accommodated in a subsequent stage or stages.

Noise and Air Emissions Overlay

The following policies apply to the 'designated area' shown on Overlay Map NPSP/1 (Overlay 7) Noise and Air Emissions.

Where the Objectives and/or Principles of Development Control that apply in relation to this overlay are in conflict with the relevant General Objectives and/or Principles of Development Control in the Development Plan, the overlay will prevail.

OBJECTIVES

Objective 1: Protect community health and amenity from adverse impacts of noise and air emissions.

PRINCIPLES OF DEVELOPMENT CONTROL

1 Noise and air quality sensitive development located adjacent to high noise and/or air pollution sources should:

(a) shield sensitive uses and areas through one or more of the following measures:

(i) placing buildings containing less sensitive uses between the emission source and sensitive land uses and areas;

(ii) within individual buildings, place rooms more sensitive to air quality and noise impacts (e.g. bedrooms) further away from the emission source;

(iii) erecting noise attenuation barriers provided the requirements for safety, urban design and access can be met;

(b) use building design elements such as varying building heights, widths, articulation, setbacks and shapes to increase wind turbulence and the dispersion of air pollutants provided wind impacts on pedestrian amenity are acceptable; and

(c) locate ground level private open space, communal open space and outdoor play areas within educational establishments (including childcare centres) away from the emission source.