REVISED/ADDITIONAL DOCUMENTATION PART 7

2017SSH019

DA17/0467

1-21 Dillwynnia Grove, Heathcote

- ARCHITECTURAL DESIGN STATEMENTS – REVISED
- ARBORIST REPORT AMENDED
- CONSTRUCTION MANAGEMENT PLAN
- ENVIRONMENTAL SITE INVESTIGATION REPORT – DETAILED

HEATHCOTE HALL ARCHITECTURAL STATEMENTS

This document is to form part of the Development Application submission for the Historic Heathcote Hall, Heathcote, NSW

1 – 21 Dillwynnia Grove, Heathcote, NSW

Prepared by Ink Architects Pty Ltd April 2017

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Nominated Architect: Gustavo Thiermann 8527

ARCHITECTURAL REPORTS

DESIGN STATEMENT

Introduction
Design Principles
The Development Proposal

SEPP 65 DESIGN VERIFICATION STATEMENT

Introduction
Design Principles
The Development Proposal

LIVABLE HOUSING REPORT
Introduction
Design Principles

The Development Proposal

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Introduction

The Cultural significance of this site and the Heritage significance of Heathcote Hall have inspired our team to produce the best possible solution that integrates sustainability from an economic, social and environmental point of view.
A Conservation Management Plan has been prepared for this site of State Significance and its analysis and policy sections should be adopted in order to guide all future works.
A detailed site analysis prepared by GMU team has identified constrains and opportunities, creating a framework before we started exploring the preferred Masterplan options from an architectural point of view.
Step by step advice by Tasman Storey from Tropman Tropman Architects has guided this team during the preparation of the concept options through to the final development of the preferred design.
We are proposing extensive restoration and adaptive re-use works to Heathcote Hall as well as the gardens and curtilage in accordance with the guidelines described on the CMP. All changes, alterations and repairs must retain and respect as much as possible of the significant fabric and values of the space, structure or element. They should be positive and supportive of the significance of the element or precinct, and the place as a whole.

Design Principles

- Create a unique site specific proposal and architectural language that is sensitive to the existing built and natural features of the setting to achieve an integrated life style with the natural features of the site of "living amongst the trees"
- Create a responsive built form that stays below the tree canopies and Heathcote Hall, concentrating taller forms towards the centre of the site and away from the edges.
- Create a responsive built form of two storey dwellings around the perimeter respecting the residential character of the surrounding area achieving zero overlooking and overshadowing impact to the public domain.
- Respond to existing vegetation and reduce impact of excavation in proximity to mature landscape, enhancing through site links and vistas towards the Hall.
- Preserve and recreate significant views to Heathcote Hall by clearing undergrowth and strategically placing building clusters.
- Utilize the site's topography to allow the built form to cascade and adapt to the level changes providing landscape buffering between existing and proposed dwellings.
- Concentrate, minimise and capsulate vehicular entry points into the site.
- Celebrate the importance of Heathcote Hall in the placement of built form, arrival sequence, and open spaces

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The development proposal

The proposed Development is concentrated in the areas described as Development Zones generally, avoiding any encroachment into the curtilage zone. The development is proposing low scale buildings facing Dillwynnia Grove along the South-West corner of the site, respecting site lines and visual connection from the Hall to the West. We are also proposing vehicular access to a Basement Carpark at the lowest level of the site, minimising visual impact. Carpark access is split between Dillwynnia Grove and Boronia Grove minimising vehicular impact on the existing road network.

The proposed Development respects the traditional access to the site via Boronia Grove and Dillwynnia Grove. These important connections to the Hall will be reinstated as pedestrian through site links allowing local residents to permeate through to the grounds and refurbished Hall and its future functions. Existing Blue Gums and Turpentine are to be protected during construction and will form part of the integrated Landscape Design.

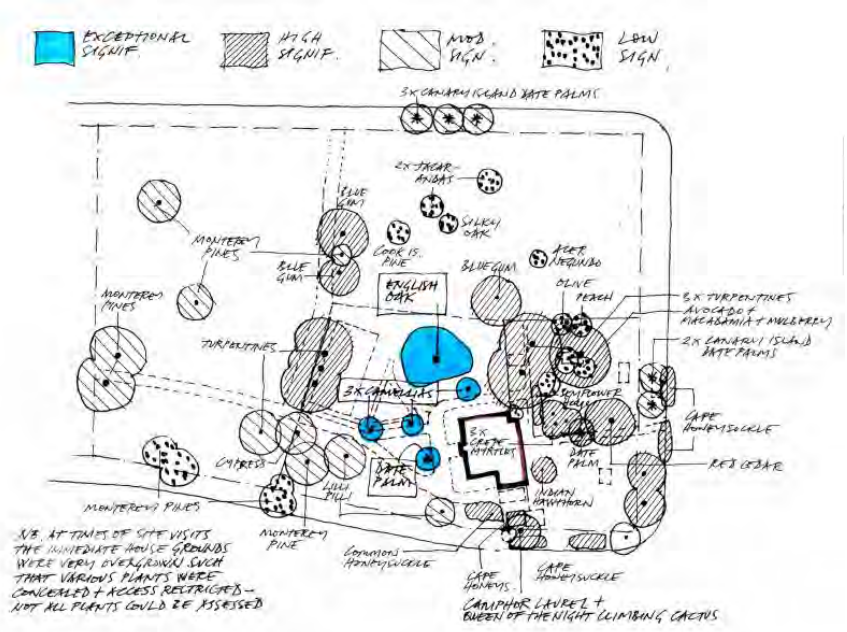

Fig 3.13 Site components – gradings of significance

Streetscape planting will be retained along Boronia Grove and Dillwynnia Grove as proposed on figure 2.33 of the CMP. It is important to retain the existing natural characteristics of the site as well as providing scale and screening.

Existing English Oak, Camellias and Date Palm in the vicinity of the Hall should be protected during Construction and included in the proposed Landscape Plan as proposed in the CMP.

The landscape character of Dillwynnia Grove and the long embankment is retained and will remain as a strong topographic feature of the site. Universal

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access to the grounds and Heathcote Hall will be provided via the gentle frontages at Boronia Grove and Tecoma Street.

The retention of the topographic character of Dillwynnia Grove will ensure that key views to the Villa and Pleasure Gardens are preserved. Clearing of the undergrowth will be essential to reinstate the glimpses of the Hall and its tower to those approaching from the West.

The proposed development is reduced in scale to two storeys along the western boundary to ensure it sits below the height of existing tree canopies. The built form will step down from Boronia Grove towards Dillwynnia Grove. The buildings will transition in height and rotate from an east-west axis that fronts the pleasure gardens and the Hall, to engage with Dillwynnia Grove Streetscape.

Traditional entry points to Heathcote Hall are proposed to be reinstated as pedestrian access, allowing site permeability to local residents. We propose Vehicular access to basement parking from Boronia Grove and Dillwynnia Grove as they are the best opportunity to bring vehicles into the development. Vehicles should not compete visually with the pedestrian nature and garden setting of the Hall and its grounds.

The proposed development respects old trees of high significance to the site: The Turpentine cluster near the western end of the reduced Heritage curtilage in addition to the English Oak and mature Camellias that form part of the Pleasure Garden are an essential asset and will preserve the character of the Pleasure Garden.

The building design takes an inspiration from the classical elements of Heathcote Hall. Vertical proportions of the tower / entry element of the Hall are reinterpreted as the entry element on the town houses. Solid timber doors with vertical proportions clearly demarcate an access element that is expressed as a vertical circulation connecting ground floor and first floor spaces. The upper section is glazed and will be partially operable, providing natural cross ventilation to eliminate the need for air conditioned spaces.
The second element in the main street elevation is a rotated roof form that becomes a contemporary interpretation of the bedrooms. These bedrooms also open up to a veranda. This element varies in density to achieve various levels of privacy from a solid nature to a transparent metal balustrade when we emphasize the connection with the Pleasure Gardens.

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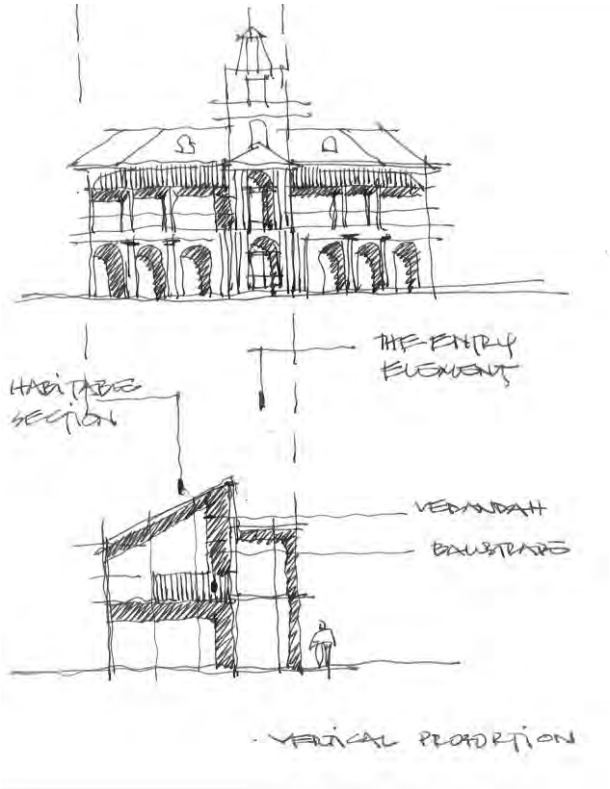

The building floor plans are largely dual aspect to maximise solar access to habitable rooms and minimise privacy issues. Dual aspect design encourages natural cross ventilation. Most dwellings are oriented towards the perimeter streets providing easy access and passive surveillance. The nature of the clusters allows for the buildings to be grouped creating courtyards that have their own nature and identity; Grevillea courtyard, Jacaranda Court, etc.
Different typology responds to corner elements enclosing private open spaces thus connecting with communal open space and streetscape.
Three storey elements emerge from the centre of the site, masked from the surrounding streets by two storey buildings and the existing vegetation. They contain one and two bedroom apartments with universal access directly from the basement carpark level. These units provide variety in the housing offer and affordability level.

Solid rendered masonry elements of the Hall become the inspiration source for our proposed buildings. A combination of earthy rendered walls with timber and metal balustrades will create enough variety whilst defining a subtle palette of materials and colours that is complimented by four shades of metal roof cladding.
Articulated facades will create a unique expression that respects the Heritage nature of the site whilst living amongst the trees.

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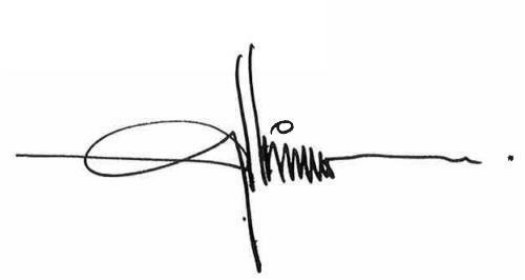
Verification of Qualifications

Gustavo Thiermann is a member of the Australian Institute of Architects Registration number is 8527.
Gustavo is a qualified Architect with extensive residential experience and the winner of the UDIA Sustainable Development Award in NSW.

Statement of Design Team

Ink Architects has been responsible for the design of the project since its inception and have worked throughout the design phases of this project with like-minded professionals.
This unique project has been designed to provide a development that is respectful of the historic characteristic of the site and Heathcote Hall. It respects and complies with the local planning and design controls and that responds to the best practice design principles of SEPP No. 65 and ADG.



Gustavo Thiermann
Design Director
Ink Architects Pty Ltd
Registered Architect NSW No.

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Principle 1: Context and Neighbourhood Character

Good design responds and contributes to its context. Context is the key natural and built features of a precinct.

Responding to context involves identifying the desirable elements of an area's existing or future character. Well-designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, streetscape and neighbourhood. Consideration of local context is important for all sites, including sites in established areas, those undergoing change or identified for change.

- The site is located at the corners of Boronia Grove to the North, Tecoma Street to the East and Dillwynnia Grove to the South.

- The proposed development site is screened by a mature and characteristic landscape. The pleasure Gardens have a classic European style, whereas the reminder of the site is native and reflects the proximity to the National Park. The proposed built form is recessive and respects the heritage significance of one of Sutherland Shire's most significant buildings.

- Two storey town house style dwellings are grouped in clusters, respecting the grain and scale of neighbouring residential dwellings. These buildings are setback from Boronia Grove and Tecoma streets to respect an existing grain and streetscape. Along Dillwynnia Grove however the buildings are setback further to respect the natural characteristics of the site. The embankment that extends from the western boundary towards the higher part of the site that forms a natural podium where the Historic Heathcote Hall is located.

- Buildings are proportioned and composed to reflect todays life style and amenity. All buildings and apartments are designed to have dual aspect facilitating solar access and cross ventilation, minimizing the need for mechanical ventilation or cooling.

- The proposed development provides a mix of one and two bedroom apartments plus a variety of two storeys, Three-bedroom town houses. This mix provides a wider selection of housing solution for a wider community in terms of affordability. Sustainability is not only about environmental aspects, yet it is about responding to commercial viability and social mix.

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Principle 2: Built Form and Scale

- The proposed buildings are low in scale and bulk, respecting the historic value and nature of this site.

- The proposed built form is contemporary and does not intend to copy the style of the Historic Hall or the surrounding architectural style. The proposed buildings are efficient in the planning thus functional and robust in form. Thermal mass and solid construction will provide sustainable homes for the new residents. Special care has been taken in the selection of roofing materials and colours, as well as the paint finishes selected to complete a palette of colours and textures that intent to complement the classic finishes of the Hall.
  The street facades and internal spaces are articulated providing variety in form, materiality and texture

- As we access the site from Boronia Grove, we have developed two apartment buildings.
  Building A houses 15 apartments over three levels. They vary in size, orientation and planning, providing variety in the residential offer.
  Building B houses 6 apartments over two levels in various floor plan options and aspects. These provide universal access via pedestrian access paths as well as a lift connection to dedicated basement parking.

Principle 3: Density

- The unique nature of this site allows this proposed residential development to create a density that is compatible with the existing precinct and provides great levels of amenity due to the vast areas of private and community gardens. The general density achieved is at a ratio of 33 dwellings per hectare.

- The proposed FSR is 0.35:1 which complies with Sutherland Council LEP requirements.

- Comprising 36 x 3 bedroom townhouses, 15 x 2 bedroom apartments and 6 x 1 bedroom apartments, the proposal reflects market demand in relation to typologies The density of the development is considered sustainable within the existing availability of infrastructure, public transport, community facilities and environmental qualities of the site

- As such the proposal provides an appropriate density for a residential development in the immediate context.

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Principle 4: Sustainability

Good design combines positive environmental, social and economic outcomes. Good sustainable design includes the use of the right materials, achieving passive thermal design. Optimum orientation promoting natural cross ventilation and sunlight for the amenity of residents and improved energy efficiency. Other elements include recycling and reuse of materials and waste, use of sustainable materials, and the specification of low VOC levels in paint finishes, glues and the like.

A comprehensive analysis of the building has been undertaken as part of the Basix Assessment however we note the following general inclusions as part of the proposal:

- 100 % of the apartment designs and townhouse layouts are cross ventilated. This is well over and above ADG recommendation and minimum standards.
- The grouping of buildings and associated shared structural elements also improves thermal mass. This is achieved both in apartments and Townhouses.
- Internal layouts and orientation have been arranged so as to provide good natural daylight and solar access to primary living areas, external private open space and courtyards
- Typical apartment floor plates line up to minimize structural transfers and maximise ceiling heights without exceeding permissible overall building heights
- Apartment lobbies are naturally ventilated and will enjoy access to natural light improving amenity whilst reducing energy costs.
- Appropriate overhangs, awning and screening have been introduced as building design elements minimizing heat overloads during equinox and summer months, thus providing efficient solar access during the shorter months in the year.
- Water storage and on-site detention tanks are integrated into the proposal.
- Energy efficient appliances and fixtures have been selected as part of the internal fit out to minimize water consumption of resources.
- Rainwater harvesting is dedicated for irrigation of landscaped areas.

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Principle 5: Landscape

Good design promotes a high level of amenity and sustainable system, resulting in better communal open spaces with a purpose. The nature of this development is one of uniqueness provided by the Heritage nature of the site enhanced and complemented by the proposed development.

- All apartments house generous balconies positioned to flow from primary living spaces and take advantage of orientation and outlook. They enjoy a variety of vistas and natural aspect only unique to the characteristics of this environment.

- The courtyard apartments benefits from perimeter planting which help the development merge with its landscaped surroundings and improve amenity and privacy for future occupants (refer to Landscape Design Statement)

- With a general focus on low maintenance, the proposal incorporates selective planting of various heights and density with an overall desire to blend into the characteristic landscaping of the precinct.

- Deep soil landscaping to a great portion of the site as well as along all boundaries of the site will aid in the filtering of views to and from the proposed development. Necessary clearing of undesired species will improve the views from and to the restored Heathcote Hall.

Principle 6: Amenity

Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident well-being.

Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, efficient layouts and service areas, and ease of access for all age groups and degrees of mobility.

- A good variety of apartment sizes, layouts and general configuration.

- Optimum building separation to comply with current SEPP 65 and ADG requirements.

- The building layouts allows ventilation to all bedrooms and habitable spaces,

with 100% of all dwellings achieving cross ventilation. Smaller building volumes and articulated facades promote corner apartments, facilitating a good flow of natural breezes.

- Adequate day light and solar access for all rooms within the apartments and townhouses.

- Carefully considered privacy measures to all balconies and bedroom windows facing adjoining properties. Code compliance has been achieved without compromising variety in the views and orientation for all dwellings.

- Our solar study has indicated that 100% of the apartments and townhouses achieve over 2 hours' solar access at June 21.

- The communal open spaces are distributed across the site creating a variety of outdoor opportunities to enjoy the natural assets provided by the unique setting.

Principle 7: Safety

Safety in design is achieved by allowing a large proportion of the dwellings to address the public domain as well as communal open spaces.

- Two clearly identifiable apartment building entrances and generous open entry areas allow for adequate passive surveillance.

- Townhouses enjoy a recognizable entry of Boronia Grove, Tecoma Street or Dillwynnia Grove in its majority. The dwellings that address the Hall are provided with pedestrian access to the front door as well as their own private courtyards.

- Secure basement car parking and storage facilities is provided with keyed access to all dwellings. Clear circulation paths in the basement allow safe pedestrian movement, in particular when waiting at the lift and access to individual parking space and storage area.

- Additional parking spaces are provided for visitors both able and disabled. Separate lift access is dedicated to Buildings A and B.

- A clear definition between public and private spaces with clear, safe access points and adequate lighting of entrances and pedestrian areas including a separate access way for pedestrian and vehicles with clear visibility and sight lines.

Principle 8: Housing Diversity and Social Interaction

Good design achieves a mix of dwelling sizes, providing housing choice for different demographics, living needs and household budgets, as well as adaptable units for future adaptability.

- The future access to the Pleasure Gardens and Heathcote Hall is a fantastic improvement to the current private fenced precinct.

- The size, configuration and mix of the apartments associated with the development provides an appropriate response to the market demand of future occupants

- As set out in DCP, min. 20% of the units are designed to be adaptable with minimum building work at a later stage. The development has also provided generous width of lobbies for ease of accessibility and analysis has been conducted to ensure the development complies with the accessibility requirements. General access for people with disabilities has also been addressed in the design of the building and common areas. In addition to the adaptable units provided, 10% of the units are designed to be compliant with features of Silver level of Livable Housing Guidelines. Therefore, considering the SEPP 65 requirements, provided adaptable units and the DCP requirements, an additional 6 LHA Silver level – Livable units are provided for compliance.

- Communal open space is designed to provide additional amenity. Well-designed landscaping encourages social interaction amongst the residents and visitors to the publicly accessible portion of the development.

- The site is located within close proximity to Heathcote Railway Station, and other public transport opportunities. Local schools are accessible at a ten-minute walk and so is the access to walks in the adjacent Royal National Park.

Principle 9: Aesthetics

Good design achieves a built form that is proportioned and a balanced composition of elements that respect the scale and presence of the Historic Heathcote Hall.

- The masterplan concept options prepared by GMU explored constrains and opportunities based on the extensive site analysis and Development Controls compliance.

- The proposed development is based on the creation of building clusters that reflect the nature of the bulk and scale of the existing urban fabric.

- A selected palette of materials, colours and finishes create a development which nestles into the natural setting, adapting to level changes respecting the Heritage Curtilage and allowing the Hall to retain the height and presence when approached from various angles.

- An interplay of light and shade will allow the buildings to constantly change in colour and texture whilst as the shadows of the dominant foliage of the natural setting move across the site from sunrise to sunset.

- Materials and colours selected for the proposed volumes are clearly inspired by the simple lines, vertical proportions and material expression of the Italianate style of the Hall. But the expression is contemporary, it is modest in scale and bulk and takes a step back to allow the Hall to recover its dominance and presence.

Introduction

"Livable homes are designed and built to meet changing needs of occupants across their lifetime"

Heathcote Hall Development has been designed over a very extensive period of time by a selected group of professional with vast experience in Urban Design, Architecture, Heritage and Landscape Architecture to fulfil our clients dream of creating a sustainable community in a very unique setting. Our proposal is respectful of the Heritage significance of Heathcote Hall and surrounding heritage gardens. The proposal provides a mix of two storey dwellings and Apartment style living that will suit a community mado of first home buyers, young families and empty nesters

Numerical requirement

Sutherland Shire Council requires that 10% of the total number of dwellings comply with a minimum of Silver Level. The proposed development has a total of 57 dwellings, so we have selected 6 dwellings to be designed specifically to comply with Silver Level or higher. The selected Apartments are

Ground Floor Unit 2 and Unit 3
Level 1 Unit 7 and Unit 8
Level 2 Unit 12 and Unit 13

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Performance design elements

	REQUIREMENTS	PROPOSED	COMPLIANCE
	"A safe continuous and step free path of travel from the street entrance and / or parking area to a dwelling entrance that is level."	The design of the previously numbered units has a safe and continuous path of travel from Boronia Grove and via a passenger lift from Basement parking. Entry door is 820 mm clear.	Yes
	"At least one, level (step free) entrance into the dwelling."	The proposed apartment design complies with this clause (see apartment design insert)	Yes
	'Where the parking space is part of the dwelling access it should allow a person to open their car doors fully and easily move around the vehicle."	Dedicated Basement Carparking spaces are 3200 mm wide x 5400 mm long clearly marked on an even firm and slip resistant surface at a grade of 1:40 or less.	Yes
	"Internal doors and corridors facilitate comfortable and unimpeded movement between spaces."	Doors will have a minimum clearance of 820 mm and a level transition and threshold. Internal corridors and passageways have a minimum of 1000 mm clear width.	Yes
	"The ground or entry level has a toilet to support easy access for home occupants and visitors."	The toilet has a minimum 1200 mm clear circulation space forward of the toilet pan exclusive of the swing of the door.	Yes

1	"The bathroom and shower is designed for easy and independent access for all home occupants."	The bathroom shower is a step free design and will have a removable screen. Grab rails can be installed at a future stage as it is located in the corner of the bathroom.	Yes
2	"The bathroom and toilet walls are built to enable grab rails to be safely and economically installed."	Construction details will be provided at Construction documentation stage to comply with the performance requirements.	Yes
3	"Internal Stairways are to be designed to reduce the likelihood of injury and enable future adaptation."	There are no stairs required in the single level apartments.	Yes
4	"Kitchen space is designed to support ease of movement between fixed benches and to support easy adaptation."	No requirements for Silver Level	Yes
5	"Laundry space is designed to support ease of movement between fixed benches and to support easy adaptation."	No requirements for Silver Level.	Yes
6	"Entry Level requirement for a bedroom space."	No requirements for Silver Level.	Yes
7	"Light switches and power points are located at heights that are easy to reach for all home occupants."	No requirements for Silver Level.	Yes

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8	"Door and tap hardware designed to be easily and independently opened and closed."	No requirements for Silver Level.	Yes
9	"Family/ living room features clear space to enable the home occupants to move in and around the room with ease."	No requirements for Silver Level.	Yes
10	"Window sills are installed at a height that enables home occupants to view the outdoor space from either a seated or standing position."	No requirements for Silver Level.	Yes
11	"Floor coverings are slip resistant to reduce the likelihood of slips and falls in the home."	No requirements for Silver Level.	Yes

Statement

I, Gustavo Thiermann, Design Director at Ink Architects, Pty Ltd, hereby confirm that the following dwellings achieve a LHD Silver livability rating.

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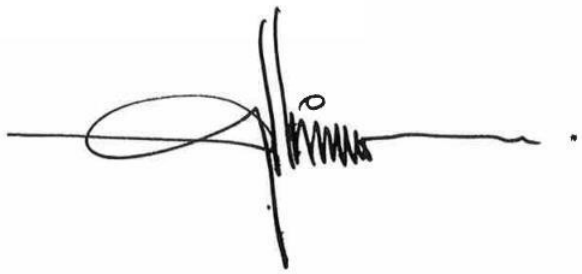
Level 1	Unit 7 and Unit 8
Level 2	Unit 12 and Unit 13



Gustavo Thiermann
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Gustavo is a registered member of the NSW Architects Registration Board No 8527

JACKSONS NATURE WORKS

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The Secretary
Fuzortinn Pty Ltd
221 – 225 Queen Street
Beaconsfield NSW 2015

8th March 2018

Dear Sir,
RE: Addendum Arborist Report at Heathcote Hall, 1 – 21 Dillwynnia Grove, Heathcote (The Site) – DA 17/0467 with Sutherland Shire Council (Council).

1. Background

A Development Application (DA 17/0467) has been lodged with Sutherland Shire Council to retain Heathcote Hall and construct a residential development on Site (development works).

To prepare this report we have reviewed the following documents:

- Arboricultural Assessment Report by Jacksons Nature Works, dated 5.12.2017 (AAR/JNW 2017)
- Site Survey by Beuthien de Nett, dated 18.9.2003;
- Architectural plans by INK Architects, dated 1.12.2017, Issue A;
- Landscape plans by Site Design & Studio, dated 5.12.2017;
- Flora and Fauna Report by Ecological Australia, dated 7.12.2017;
- Email from Ms L Pemberton, Environmental Assessment Officer – Planner, Sutherland Shire Council, dated 1.3.2018;
- Sutherland Shire Local Environmental Plan 2015, Clause 5.9 (TPO); &
- Sutherland Shire Council maps: Green web, Heritage SSLEP 2006 & Vegetation Communities; &
- Australian Standard AS 4970 – 2009 Protection of trees on development sites.

Council have requested additional information in their email dated 1.3.2018 to explain the assessment of the trees to be retained and removed.

This report will examine the design and provide Council with our discussions and recommendations for their approval.

2. Observations

The same tree numbering used in this report are those used in the AAR/JNW 2017 for ease of reference.

Our tree observations can be found in Annexure A.

Our tree location plan can be found in Annexure B.

3. Discussions

3.1 The following comments are advised in response to Councils request:

a. The original arborist report by JNW, was dated October 2015 and was updated in the AAR/JNW 2017 report. Consequently Council have advised, "there were 64 changes in trees to be removed and retained when compared with the October 2015 report"; &
b. The AAR/JNW 2017 report was a collaboration between Site Design & Studio, INK Architects and Jacksons Nature Works to provide Council with the latest assessment;

3.2 The following details are now provided to Council in regard to the changes of the retained and removed trees by comparison to the October 2015 report and AAR/JNW 2017 report:

Tree Nos	Tree species	2015 Report	2017 Report	Comments
2a	*Exocarpos cupressiformis*	K	RB	Building impacts & to remove from surrounding trees due to parasitic species
3	*Phoenix canariensis*	K	K	2015 design has driveway within TPZ, now not impacted – keep
4	*Phoenix canariensis*	K	K	2015 design has driveway within TPZ, now not impacted – keep
5	*Phoenix canariensis*	K	K	2015 design has driveway within TPZ, now not impacted – keep
5a	*Pittosporum undulatum (P. undulatum)*	K	K	2015 design has driveway within TPZ, now not impacted – keep
5b	*P. undulatum*	K	K	2015 design has driveway within TPZ, now not impacted – keep
7	*Syncarpia glomulifera (S. glomulifera)*	Not listed	K	<10% impacts within TPZ – keep
7a	*P. undulatum*	Not listed	K	<10% impacts within TPZ – keep
7b	*P. undulatum*	Not listed	K	<10% impacts within TPZ – keep
8/9	*Dead stump*	K	Remove	Remove for safety reasons
10	*Eucalyptus saligna (E. saligna)*	RB	K	<10% impacts within TPZ – keep
10a	*Eucalyptus paniculata (E. paniculata)*	RB	K	<10% impacts within TPZ – keep
15a	*P. undulatum*	Poor form	K	<10% impacts within TPZ – keep
17c	*E. sp*	Poor form	K	<10% impacts within TPZ – keep
22	*E. saligna*	K	RB	Dangerous Street tree – remove for safety
23	*E. saligna*	Remove	Remove	¾ Dead (dangerous) – remove
25c	*Pinus radiata (P. radiata)*	K	Listed as Exempt	Street tree <10% impacts within TPZ – keep
28c	*P. undulatum*	K	RB	>10% impacts within TPZ – remove
29a	*Ficus rubiginosa*	K	K	<10% impacts within TPZ – keep
34	*E. saligna*	Remove	RB	Dangerous tree with fungus – remove

37a	*E. saligna*	Poor form	K	<10% impacts within TPZ. ST – keep
38	*P. undulatum*	RB	K	<10% impacts within TPZ – keep
41b	*P. undulatum*	Not listed	K	<10% impacts within TPZ – keep
45	*E. paniculata*	K	RB	>10% impacts within TPZ – remove
45a	*P. undulatum*	Not listed	RB	>10% impacts within TPZ – remove
45b	*Acacia decurrens*	Not listed	RB	>10% impacts within TPZ – remove
45c	*E. paniculata*	Poor form	K	<10% impacts within TPZ – keep
45d	*P. undulatum*	Not listed	K	<10% impacts within TPZ – keep
46	*E. sp.*	K	RB	>10% impacts within TPZ – remove
46a	*P. undulatum*	K	RB	>10% impacts within TPZ – remove
46b	*P. undulatum*	K	RB	>10% impacts within TPZ – remove
47	*E. paniculata*	K	RB	>10% impacts within TPZ – remove
47a	*S. glomulifera*	Poor form	RB	>10% impacts within TPZ – remove
47b	*P. undulatum*	Poor form	RB	>10% impacts within TPZ – remove
47c	*S. glomulifera*	Poor form	RB	>10% impacts within TPZ – remove
47d	*P. undulatum*	Poor form	K	<10% impacts within TPZ – keep
47e	*P. undulatum*	Poor form	K	<10% impacts within TPZ – keep
47f	*S. glomulifera*	Poor form	K	<10% impacts within TPZ – keep
47g	*E. saligna*	Poor form	K	<10% impacts within TPZ – keep
47h	*P. undulatum*	Poor form	K	<10% impacts within TPZ – keep
48a	*S. glomulifera*	Poor form	K	<10% impacts within TPZ – keep
48b	*E. paniculata*	Poor form	K	<10% impacts within TPZ – keep
49a	*P. undulatum*	Poor form	K	<10% impacts within TPZ – keep
49b	*E. paniculata*	Poor form	K	<10% impacts within TPZ – keep
53	*E. paniculata*	RB	K	<10% impacts within TPZ – keep
54	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
57b	*E. paniculata*	RB	K	<10% impacts within TPZ – keep
57e	*Brachychiton x acerifolius*	RB	K	<10% impacts within TPZ – keep
57f	*E. paniculata*	Not listed	K	<10% impacts within TPZ – keep
57g	*E. paniculata*	Not listed	K	<10% impacts within TPZ – keep
57h	*S. glomulifera*	Not listed	K	<10% impacts within TPZ – keep
57i	*E. paniculata*	Not listed	K	<10% impacts within TPZ – keep
57j	*Macadamia tetraphylla*	Not listed	K	<10% impacts within TPZ – keep
57k	*Dead tree*	Not listed	K	Next door. <10% impacts within TPZ – keep

57l	*Dead tree*	Not listed	K	Next door. <10% impacts within TPZ – keep
57m	*Dead tree*	Not listed	K	Next door. <10% impacts within TPZ – keep
65	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
65a	*P. undulatum*	RB	K	<10% impacts within TPZ – keep
79	*Pinus radiata (P. radiata)*	Exempt	K	<10% impacts within TPZ – keep
80	*E. saligna*	RB	K	<10% impacts within TPZ – keep
82a	*P. undulatum*	RB	K	<10% impacts within TPZ – keep
85	*Araucaria heterophylla*	K	RB	>10% impacts within TPZ – remove
86	*E. saligna*	K	RB	>10% impacts within TPZ – remove
90	*E. saligna*	K	RB	>10% impacts within TPZ – remove
96	*E. saligna*	K	RB	>10% impacts within TPZ – remove
98	*E. saligna*	RB	K	<10% impacts within TPZ – keep
98a	*E. saligna*	K	RB	>10% impacts within TPZ – remove
99	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
99b	*Persea americana*	Exempt	K	<10% impacts within TPZ – keep
99c	*Persea americana*	Exempt	K	<10% impacts within TPZ – keep
99d	*Macadamia tetraphylla*	Exempt	K	<10% impacts within TPZ – keep
100	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
102	*Quercus robur*	RB	K	<10% impacts within TPZ – keep with care
102b	*P. undulatum*	K	RB	>10% impacts within TPZ – remove
107a	*Michelia figo*	RB	K	<10% impacts within TPZ – keep
107c	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
107g	*Brachychiton x acerifolius*	RB	K	<10% impacts within TPZ – keep
108	*P. undulatum*	RB	K	<10% impacts within TPZ – keep
109	*P. undulatum*	RB	K	<10% impacts within TPZ – keep
110	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
111	*E. saligna*	RB	K	<10% impacts within TPZ – keep
112	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
113	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
114	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
116	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep
117	*Cupressus sempervirens*	Exempt	K	<10% impacts within TPZ – keep
118a	*P. undulatum*	RB	K	<10% impacts within TPZ – keep
123j	*P. undulatum*	K	RB	>10% impacts within TPZ – remove
124	*Laurus nobilis*	RB	K	<10% impacts within TPZ – keep
128	*Toona ciliata*	RB	K	<10% impacts within TPZ – keep
134	*P. radiata*	Exempt	K	<10% impacts within TPZ – keep Street tree
136a	*P. radiata*	Exempt	K	<10% impacts within TPZ – keep Street tree
137c	*Dead tree*	Remove	K	<10% impacts within TPZ – keep Street tree
138	*Cinnamomum camphora*	Exempt	K	<10% impacts within TPZ – keep Street tree
138b	*Cinnamomum camphora*	Exempt	K	<10% impacts within TPZ – keep Street tree
139	*P. undulatum*	Not listed	K	<10% impacts within TPZ – keep
149	*P. radiata*	Exempt	K	<10% impacts within TPZ – keep
162	*S. glomulifera*	RB	K	<10% impacts within TPZ – keep

3.3 The recommendations of the AAR/JNW 2017 are summarised in the recommendations and include the trees discussed in this report.

4. Recommendations

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained.

The report specifically recommends

a. Retain the following street trees: Tree 1, 1a, 1b, 1c,1d,1e, 1f, 1g, 1h, 2, 3, 4, 5, 5a, 5b, 6, 7, 7a, 7b, 11, 12, 13, 14, 15, 15a, 16, 17, 17a, 17b, 17c, 18, 19, 20, 21, 25, 25a, 25b, 25c, 26, 27, 28, 28a, 28b, 28d, 29, 29a, 30, 31, 36, 37, 37a, 38, 39, 40, 40a, 40b, 40c, 40d, 40e, 41a, 41b, 42, 43, 44, 45, 45b, 45c, 45d, 47d, 47e, 47g, 47h, 48, 48a, 48b, 49, 49a, 49b, 50, 51, 51a, 51b, 51c, 51d, 51e, 51f, 52, 52a, 52b, 52c, 134, 134a, 134b, 135, 136, 136a, 137, 137a, 137b, 137c, 137d, 137e, 137f, 137g, 138, 138a, 138b, 140, 140a, 143, 143b, 143c, 145, 147, 148, 150, 151, 152, 154, 155, 156, 157, 158, 158a, 168, 169 & 170;
b. Remove the following street trees: Trees 2a, 8/9, 22, 28c, 45a, 46, 46a, 46b, 47, 47a & 47b;
c. Retain the following trees on site: Tree 10, 10a, 13a, 41, 47f, 47i, 53, 54, 65, 65a, 80, 82a, 87, 98, 99, 99b, 99c, 99d, 100, 101, 102, 105, 106, 107a, 107b, 107c, 107g, 108, 109, 110, 111, 112, 113, 114, 116, 117, 119, 123, 123h, 124, 125, 126, 127, 128, 129, 129a, 130, 131a, 132, 132a, 133, 139, 141, 149, 149a, 149b, 162, 171, 171a, 171b &171c, ;
d. Remove the following trees on site: Tree 23, 34, 47c, 56, 56a, 57, 57a, 57d, 58a, 58b, 60, 60a, 60b, 61, 62, 63, 65b, 66a, 67, 68, 69, 70, 70a, 71, 71a, 72, 72a, 74, 75a, 75b, 76, 77, 78, 81, 83, 84, 85, 86, 87a, 88, 89b, 89c, 90, 91, 92, 94, 95, 96, 97, 98a, 102a, 102b, 1034, 104, 107, 115, 115a, 123a, 123j, 143a, 161a, 163b, 166a, 167 & 173a;
e. Remove the following Exempt trees on site: Tree – Privet trees in and around 38 – 47, 55, 57c, 58, 59, 64, 66, 73, 75, 79, 82, 89, 89a, 96a, 99a, 100a, 107d, 107e, 107f, 115b, 117a, 118, 118b, 122, 122 (area), 123b, 123c, 123d, 123e, 123f, 123g, 123i, 128a, 130a, 142, 144, 153, 160, 161, 161b, 163a, 164, 165, 171d, 172, 173, 174, 175, 176, 176a & 177;
f. Retain the following trees in the neighbour's properties: Trees 57b, 57e, 57f, 57g, 57h, 57i, 57j, 57k, 57l & 57m;
g. That DA 17/0467 be approved by Sutherland Shire Council Council;
h. Tree removal work shall be carried out by an experienced tree surgeon in accordance with *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal (2016)*;
i. That the retained trees be deadwooded to ensure the on-going safety of the future residents of this site. All deadwooding shall be in conformity with AS 4373 – 2007 Pruning of amenity trees Section 3.17 & 7.2.2 *Deadwooding* and performed by a qualified and experienced arborist who holds Australian Qualifications Level 3 in Horticulture (Arboriculture);
j. That at least 12 acorns be collected from tree 102 and propagated as a replacement tree for Tree 102. The acorn collector shall be a recognised and experienced propagator who has industry experience in propagation to ensure

the successful propagation of the acorns. Once, the seedlings are 2 years old, at least two shall be planted within the vicinity of tree 102, then when well established tree 102 shall be removed;

k. That Tree 102 shall be pruned to remove deadwood and defective branches in conformity with AS 4373 – 2007 Pruning of amenity trees Section 3.17 & 7.2.2 *Deadwooding* and Section 7.40 & 7.2.4 *Selective pruning* and performed by a qualified and experienced arborist who holds Australian Qualifications Level 3 in Horticulture (Arboriculture);
l. Install the following Tree Protection Measures around the retained trees: Tree protection measures shall be a temporary fence of chain wire panels 1.8 metres in height (or equivalent), supported by steel stakes or concrete blocks as required and fastened together and supported to prevent sideways movement. Existing boundary fences or walls are to be retained shall constitute part of the tree protection fence where appropriate. A sign is to be erected on the tree protection fences of the trees to be retained that the trees are covered by Council's tree preservation orders and that "No Access" is permitted into the tree protection zone;
m. Trunk protection shall consist of a padding material such as hessian or thick carpet underlay wrapped around the trunk. Hardwood planks (50mm x 100mm or similar) shall be placed over the padding and around the trunk of the tree at 150mm centres. The planks shall be secured with 8-gauge wire or hoop steel at 300mm spacing. Trunk protection shall extend a minimum height of 2 metres or to the maximum possible length permitted by the first branches on retained trees – refer Annexure D;
n. That a Tree Management Plan be prepared as part of the Construction Certificate by a consulting arborist who holds the Diploma in Horticulture (Arboriculture), Level 5 under the Australian Qualification Framework;
o. An AQF Level 5 Project Arborist shall be engaged to supervise the building works and certify compliance with all Tree Protection Measures;
p. Our tree location plan can be found on Annexure B; &
q. The Tree Impact Plan can be found on Annexure C.

Ross Jackson M.A.A (Nos. 1695) & M.A.I.H.
Consulting Arborist
Graduate Certificate in Arboriculture – AQF Level 8 (Honours)
Diploma Horticulture (Arboriculture) – AQF Level 5
Certificate III in Horticulture
Certificate in Horticulture (Landscape – Honours)

Annexure A: Observations as seen on the day of inspection of trees

Tree No	Botanical Name	Age Class	Height (m)	Spread (m)	D.B.H. (cm)	D.R.B. (cm)	TPZ (radius m)	SRZ (radius m)	Condition comments as seen on site	ULE	**Tree outcome; Remove in building (RB), Keep (K), Exempt remove (Ex)**
1	*Eucalyptus (E.) globoidea*	M	18	18	90	97	10.8	3.3	G (Street tree St.)	2	K
1A	*Syncarpia (S.) glomulifera*	M	7	6	26	38	3.1	2.2	F – 20% DW, Thin foliage density, pruning. 3 stems St	3	K
1B	*Pittosporum (P.) undulatum*	M	5	5	13	14	2.0	1.5	G - St	2	K
1C	*P. undulatum*	M	4	3	12	14	2.0	1.5	G – St	2	K
1D	*P. undulatum*	M	5	4	22	30	2.6	2.0	G - St	2	K
1E	*S. glomulifera*	M	7	5	15	18	2.0	1.6	G - St	2	K
1F	*S. glomulifera*	M	8	6	20	26	2.4	1.9	G - St	2	K
1G	*Dead*	D							Dead tree - St	4A	K
1H	*P. undulatum*	M	8	5	18	22	2.2	1.8	G. Street tree - St	2	K
2	*E. globoidea*	M	18	12	50	60	6.0	2.7	F – G – trunk in jury at 4m with minor decay. Split branch union at 6m - St	2D	K
2A	*Exocarpos cupressiformis*	M	5	6	17	20	2.0	1.7	G – parasitic tree - St	5	RB
3	*Phoenix (Ph.) canariensis*	M	10	12	80	90	9.6	3.2	G - St	2	K
4	*Ph. canariensis*	M	11	12	82	91	9.8	3.2	G - St	2	K
5	*E. saligna*	M	20	18	105	105	12.6	3.4	G – twin trunks - St	2	K

5A	*P. undulatum*	M	8	5	19	30	2.3	2.0	G – growing beside tree 5. Consider removal (less competition) - St	3 (5)	K
5B	*P. undulatum*	M	8	5	28	30	3.4	2.0	G – growing beside tree 5. Consider removal (less competition) - St	3 (5)	K
6	*E. paniculata*	M	25	14	52	58	6.2	2.6	F but suspect trunk integrity – *Phellinus robusta* seen at 4m. DW (20%) - St	4C	K
7	*S. glomulifera*	M	18	12	74	83	8.9	3.1	G- St	2	K
7A	*P. undulatum*	M	5	3	13	16	2.0	1.5	G suppressed by T. 7 - St	3	K
7B	*P. undulatum*	M	5	3	14	20	2.0	1.7	G suppressed by T. 7 - St	3	K
8 & 9	*Stump*								Remove dead stump	5	Ex
10	*E. saligna*	M	25	20	98	101	11.8	3.3	G – D W to mid canopy (25%)	3	K
10A	*E. paniculata*	M	8	5	21	30	2.5	2.0	G <5% DW	2	K
11	*E. saligna*	M	25	18	104	124	12.5	3.6	F – shed limb at 7, 8 & 12m, basal cavity, N trunk hollow at 4m	3 (4C)	K
12	*Ph. canariensis*	M	8	6	57	75	6.8	2.9	G - St	2	K
13	*E. saligna*	M	12	6	41	48	4.9	2.4	F – A, trunk hollows, cavities & epicormic regrowth - St	3C	K
13A	*S. glomulifera*	M	8	6	46	60	5.5	2.7	G	2	K

14	*E. saligna*	M	25	8	81	94	9.7	3.2	F – dead branch stubs to 8m, failed branches at 12 & 16m - St	3C	K
15	*E. saligna*	M	25	10	66	83	7.9	3.1	F – G, dead stub at 8m - St	2	K
15A	*P. undulatum*	M	5	3	15	20	2.0	1.7	F – apical growing point lost - St	3	K
16	*S. glomulifera*	M	8	6	48	60	5.8	2.7	G – 2 trunk. Suppressed form - St	3	K
17	*Ph. canariensis*	M	6	6	43	58	5.2	2.6	G - St	2	K
17A	*S. glomulifera*	M	18	10	73	84	8.8	3.1	F – DW <10% - St	3	K
17B	*P. undulatum*	M	5	5	16	20	2.0	1.7	G - St	2	K
17C	*Eucalyptus sp.*	M	8	3	20	29	2.4	2.0	F – leaning to street - St	3	K
18	*S. glomulifera*	M	12	6	35	44	4.2	2.3	G - St	2	K
19	*E. saligna*	M	25	14	93	114	11.2	3.5	F – G. OHPL pruning. Shed limb at 10m - St	2D	K
20	*S. glomulifera*	M	12	6	35	43	4.2	2.3	G - St	2	K
21	*S. glomulifera*	M	12	8	59	70	7.1	2.8	G - St	2	K
22	*E. saligna*	M	20	6	112	134	13.4	3.7	E trunk – G with OHPL pruning, W trunk dead (8m). Termites - St	2D	RB, also structurally defective
23	*E. saligna*	OM	18	8	100	115	12.0	3.5	P – ¾ dead	4A	RB, also structurally defective
24	*Not found*										

25	*E. saligna*	M	25	10	63	84	7.6	3.1	G – basal injury (stable) - St	2	K
25A	*E. saligna*	M	24	6	50	62	6.0	2.7	G - St	2	K
25B	*Jacaranda mimosifolia*	M	8	4	20	30	2.4	2.0	G – small Callistemon viminalis next to this tree – G - St	2	K
25C	*Pinus radiata*	M	7						Exempt tree - St	5	Ex
26	*E. saligna*	M	25	12	110	130	13.2	3.7	F – G Dead stub at 7m. Basal injury (solid). Lightning hit - St	2	K
27	*Ficus microcarpa* var. *Hillii*	M	5	5	17	20	2.0	1.7	G - St	2	K
28	*E. saligna*	M	10	5	35	60	4.2	2.7	F & P structure (canopy all epicormic regrowth) - St	4C	K
28A	*E. saligna*	M	14	12	73	93	8.8	3.2	G with long laterals & squat - St	3	K
28B	*P. undulatum*	M	7	8	27	40	3.2	2.3	G - St	2	K
28C	*P. undulatum*	M	6	4	15	18	2.0	1.6	F suppressed form - St	3	RB
28D	*Banksia integrifolia*	M	6	2	16	19	2.0	1.6	G - St	2	K
29	*Ph. canariensis*	M	8	8	62	82	7.4	3.0	G - St	2	K
29A	*Ficus rubiginosa*	M	8	10	44	53	5.3	2.5	G – 3 trunks - St	2	K
30	*Ph. canariensis*	M	7	8	53	80	6.4	3.0	G - St	2	K
31	*Ph. canariensis*	M	8	8	64	96	7.7	3.3	G - St	2	K

32	*Not found*										
33	*Not found*										
34	*E. saligna*	M	20	16	100	120	12.0	3.6	F & P structural integrity (*Phellinus robusta* seen at 6m). Shed branches x 4, Trunk cavity at 12m	4C	RB
35	*Not found*										
36	*E. paniculata*	M	14	6	39	46	4.7	2.4	G - St	2	K
37	*E. saligna*	M	8	6	39	45	4.7	2.4	G, leaning towards street - St	3	K
37A	*E. saligna*	M	7	4	21	40	2.5	2.3	P all epicormic regrowth - St	4C	K
38	*P. undulatum*	M	8	8	38	50	4.6	2.5	G – twin trunk - St	2	K
39	*E. saligna*	M	10	6	36	45	4.3	2.4	G suppressed form - St	3	K
40	*E. paniculata*	M	10	8	36	42	4.3	2.3	F – small crown & 20% epicormic regrowth - St	3	K
40A	*P. undulatum*	M	7	4	17	22	2.0	1.8	G - St	2	K
40B	*P. undulatum*	M	8	6	25	36	3.0	2.2	G twin trunk - St	2	K
40C	*P. undulatum*	M	7	5	27	40	3.2	2.3	G - St	2	K
40D	*P. undulatum* x 4	M	5	3	18	28	2.2	1.9	G - St	2	K
40 E	*P. undulatum*	M	6	5	15	20	2.0	1.7	G - St	2	K
41	*E. saligna*	M	18	10	47	58	5.6	2.6	G	2	K
41A	*P. undulatum* x 2	M	8	6	22	28	2.6	1.9	G – St	2	K
41B	*P. undulatum*	M	8	6	35	40	4.2	2.3	G – St	2	K
42	*S. glomulifera*	M	8	6	26	31	3.1	2.0	G - St	2	K

43	*E. paniculata*	M	18	10	45	56	5.4	2.6	F – G crown lifted, DW (<10%), epicormic regrowth (minor) - St	3	K
44	*E. saligna*	M	20	10	49	59	5.9	2.7	G- St	2	K
45	*E. paniculata*	M	20	16	73	84	8.8	3.1	G. DW,10%, Bark/fork at 4m - St	3	RB, in driveway
45A	*P. undulatum*	M	6	4	12	18	2.0	1.6	G – St	2	K
45B	*Acacia decurrens*	M	9	6	16	20	2.0	1.7	G suppressed form - St	3	RB
45C	*E. paniculata*	SM	6	1	11	16	2.0	1.5	G – pole like - St	3	K
45D	*P. undulatum*	M	7	4	15	20	2.0	1.7	G - St	2	K
38 - 47	*Ligustrum (L.) lucidum*	M							Noxious weed between these trees. Remove	5	Ex
46	*Eucalyptus sp.*	M	8	2	30	30	3.6	2.0	P cavity, termites & injuries - St	4C	RB, also structurally defective
46A	*P. undulatum*	M	7	4	15	18	2.0	1.6	G - St	2	RB, in driveway
46B	*S. glomulifera*	M	7	4	37	50	4.4	2.5	A – apical point dead - St	4C	RB, in driveway
47	*E. paniculata*	M	18	10	45	54	5.4	2.6	G – F - St	3	RB, in driveway
47A	*S. glomulifera*	M	6	3	26	30	3.1	2.0	F suppressed form - St	3	RB, in driveway
47B	*P. undulatum*	M	7	7	23	27	2.8	1.9	G – suppressed form – St	3	RB, in driveway
47C	*S. glomulifera*	M	8	5	29	30	3.5	2.0	G – suppressed form – St	3	RB
47D	*P. undulatum*	M	7	4	17	20	2.0	1.7	G – suppressed form – St	3	K

47E	*P. undulatum*	M	6	6	24	27	2.9	1.9	G – suppressed form – St	3	K
47F	*S. glomulifera*	M	8	5	21	28	2.5	1.9	G – suppressed form – St	3	K
47G	*E. saligna*	M	12	8	36	43	4.3	2.3	G – suppressed form – St	3	K
47H	*P. undulatum*	M	6	4	18	22	2.2	1.8	G – suppressed form – St	3	K
47I	*S. glomulifera*	M	6	4	19	20	2.3	1.7	G – suppressed form. 2 trunk - St	3	K
48	*E. saligna*	M	25	20	90	108	10.8	3.4	G - St	2	K
48A	*S. glomulifera*	SM	8	1	18	29	2.2	2.0	F – pole like/small canopy - St	3	K
48B	*E. paniculata*	M	8	2	25	30	3.0	2.0	F branch prune at 4m, small canopy - St	3	K
49	*S. glomulifera*	M	9	4	25	28	3.0	1.9	G – St	2	K
49A	*P. undulatum*	M	8	6	22	27	2.6	1.9	G – St	2	K
49B	*E. paniculata*	M	9	3	21	22	2.5	1.8	G – suppressed form – St	2	K
50	*E. paniculata*	M	20	14	52	63	6.2	2.7	G - St	2	K
51	*E. paniculata*	SM	12	2	23	29	2.8	2.0	F – pole like (suppressed) – St	3	K
51A	*Acacia decurrens*	M	8	5	12	15	2.0	1.5	G – St	2	K
51B	*Acacia decurrens*	M	8	5	17	20	2.0	1.7	G – St	2	K
51C	*Eucalyptus sp.*	M	12	3	19	27	2.3	1.9	G (pole like & suppressed) – St	3	K
51D	*Eucalyptus sp.*	M	14	6	45	60	5.4	2.7	F (attached to dead stump). Termites - St	3 (4C)	K

51E	*Acacia decurrens*	M	6	3	12	17	2.0	1.6	G – St	3	K
51F	*Acacia decurrens*	M	7	3	15	18	2.0	1.6	G – St	3	K
52	*E. saligna*	M	10	5	26	29	3.1	2.0	G – suppressed form – St	3	K
52A	*P. undulatum*	M	8	6	30	40	3.6	2.3	G – St	2	K
52B	*E. paniculata*	M	12	6	35	45	4.2	2.4	G – St	2	K
52C	*E. paniculata*	M	8	4	18	24	2.2	1.8	G – St	2	K
53	*E. paniculata*	M	14	6	32	40	3.8	2.3	G	2	K
54	*S. glomulifera*	M	8	8	40	42	4.8	2.3	G	2	K
55	*Dead tree*	D							Dead with decay fungi - Exempt	4A	Ex
56	*E. paniculata*	M	25	18	80	100	9.6	3.3	F – G, DW (10%), Shed branches	3	RB
56A	*S. glomulifera*	M	12	10	55	65	6.6	2.8	F – G. Suppression to N	3	RB
57	*E. botryoides*	M	10	2	22	27	2.6	1.9	P – ½ dead	4A	RB, also structurally defective
57A	*Eucalyptus sp.*	M	8	3	47	60	5.6	2.7	P – topped at 7m	4C	RB
57B	*E. paniculata*	M	22	20	80	91	9.6	3.2	G – DW (10%), ND	3	K
57C	*L. sinense*	M	6						Noxious weed - Exempt	5	Ex
57D	*P. undulatum*	M	6	3	10	18	2.0	1.6	G	3	RB
57E	*Brachychiton x acerifolius*	M	7	4	21	24	2.5	1.8	G, ND	2	K
57F	*E. paniculata*	M	10	4	34	40	4.1	2.3	F, ND	2a	K
57G	*E. paniculata*	M	20	12	70	88	8.4	3.1	G, ND	2a	K
57H	*S. glomulifera*	M	12	6	52	60	6.2	2.7	G, ND	2a	K
57I	*E. paniculata*	M	20	10	54	60	6.5	2.7	G, ND	2a	K

57J	*Macadamia tetraphylla*	M	7	5	20	24	2.4	1.8	G, ND	2a	K
57K	*Dead Tree*								ND		K
57L	*Dead Tree*								ND		K
57M	*Dead Tree*								ND		K
58	*Dead*	D							Dead tree - Exempt	4A	Ex
58A	*P. undulatum*	M	8	4	22	24	2.6	1.8	G	3	RB
58B	*P. undulatum*	M	9	5	21	24	2.5	1.8	G	3	RB
59	*Pinus radiata*	M	20						Exempt tree	5	Ex
60	*E. paniculata*	M	12	4	26	32	3.1	2.1	A – very small canopy	3 (5)	RB
60A	*S. glomulifera*	M	8	4	21	26	2.5	1.9	G	2	RB
60B	*E. paniculata*	M	8	5	24	27	2.9	1.9	G	2	RB
61	*S. glomulifera*	M	12	6	54	55	6.5	2.6	G – bifurcated at 1 – 1.5m, Suppressed form	4C	RB
62	*E. paniculata*	M	14	7	32	38	3.8	2.2	G – suppressed form	3	RB
63	*S. glomulifera*	M	8	4	25	27	3.0	1.9	G	2	RB
64	*Dead tree*	D							Dead - Exempt	4A	Ex
65	*S. glomulifera*	M	10	6	39	55	4.7	2.6	G	2	K
65A	*P. undulatum*	M	7	4	19	21	2.3	1.7	G	2	K
65B	*P. undulatum*	M	8	5	14	17	2.0	1.6	G	3	RB
66	*Dead*	D							Dead tree - Exempt	4A	Ex
66A	*P. undulatum*	M	7	6	26	28	3.1	1.9	F – borers, thinning foliage density	4C	RB
67	*S. glomulifera*	M	9	7	37	42	4.4	2.3	F – G distorted canopy form & suppressed. Date Palm at base	3	RB

68	*P. undulatum*	M	9	5	25	34	3.0	2.1	G	2	RB
69	*S. glomulifera*	M	10	7	37	47	4.4	2.4	G	2	RB
70	*S. glomulifera*	M	8	5	34	49	4.1	2.5	G	2	RB
70A	*S. glomulifera*	M	7	3	14	16	2.0	1.5	F – suppressed form	3	RB
71	*S. glomulifera*	M	14	6	37	42	4.4	2.3	G – bifurcated at 4m	3 (4C)	RB
71A	*E. paniculata*	M	7	1	15	18	2.0	1.6	G – suppressed form. Privet entwined in root plate	5	RB
72	*S. glomulifera*	M	14	6	36	42	4.3	2.3	G	2	RB
72A	*P. undulatum*	M	6	6	18	20	2.2	1.7	G	2	RB
73	*Dead*	D							Dead tree - Exempt	4A	Ex
74	*S. glomulifera*	M	10	8	42	49	5.0	2.5	G	2	RB
75	*Pinus radiata*	M							Exempt tree	5	Ex
75A	*P. undulatum*	M	7	8	28	35	3.4	2.1	G	2	RB
75B	*Araucaria heterophylla*	M	9	5	34	34	4.1	2.1	G – bifurcated at 2m. Small leafed Privet beside	3	RB
76	*E. paniculata*	M	20	20	81	89	9.7	3.2	G	2	RB
77	*E. saligna*	OM	16	16	77	120	9.2	3.6	F – A, DW 20%, Basal injury, Epicormic regrowth 10%, Failed branches, Trunk injury at 6m	4C	RB, also structurally defective
78	*E. saligna*	M	25	25	150	170	15.0	4.1	G – DW at <10%, Minor epicormic regrowth	2	RB
79	*Pinus radiata*	M	8	5	38	36	4.5	2.2	Exempt tree	5	K

80	*E. saligna*	M	16	16	100	110	12.0	3.4	F. Branch failures at 5, 6 & 8m. DW at <10%	3 (4A)	K
81	*E. amplifolia*	M	14	8	56	105	6.7	3.4	G – DW <10%	3	RB
82	*Pinus radiata*	M							Exempt tree	5	Ex
82A	*P. undulatum*	M	8	8	26	26	3.1	1.9	G	2	K
83	*E. amplifolia*	M	10	6	39	42	4.7	2.3	G – DW <10%	3	RB
84	*Angophora (An.) costata*	M	9	5	31	34	3.7	2.1	G	2	RB
85	*Araucaria columnaris*	M	10	5	37	41	4.4	2.3	G	2	RB
86	*E. saligna*	M	16	8	56	66	6.7	2.8	G	2	RB
87	*E. microcorys*	M	20	10	59	71	7.1	2.9	G	2	RB
87A	*E. paniculata*	M	8	6	21	24	2.5	1.8	F – distorted branch form at 4m	3	RB
88	*Jacaranda mimosifolia*	M	10	10	40	54	4.8	2.6	G – 4 trunks	3	RB
89	*Grevillea robusta*	M							Exempt tree	5	Ex
89A	*Acer negundo*	M							Exempt tree	5	Ex
89B	*Jacaranda mimosifolia*	M	10	6	32	35	3.8	2.1	G	2	RB
89C	*Callistemon viminalis*	M	7	4	25	30	3.0	2.0	P – upper canopy failure	4C	RB
90	*E. saligna*	M	30	16	69	74	8.3	2.9	G – DW <10%	2	RB
91	*Jacaranda mimosifolia*	M	9	8	41	42	4.9	2.3	F but A form (2 trunks)	3 (4C)	RB
92	*E. microcorys*	M	24	18	72	79	8.6	3.0	G bifurcated at 2m	3 (4C)	RB
93	*Not found*										

94	*E. saligna*	M	10	8	50	57	6.0	2.6	A – P, leaning, DW, Epicormic regrowth	4C	RB
95	*E. saligna*	M	16	8	47	54	5.6	2.6	F DW, leaning, poor form	4C	RB
96	*E. saligna*	M	16	16	48	55	5.8	2.6	F 2 branch failures	4C	RB
96A	*Acer negundo*	M							Exempt tree	5	Ex
97	*E. saligna*	OM	30	18	200	180	15.0	4.2	P – 4 trunks, 3 dead. Live branch failure. DW	4C	RB
98	*E. saligna*	M	30	24	102	114	12.2	3.5	G but failed branch at 10m. DW <10%	2D	K
98A	*E. saligna*	M	30	8	62	69	7.4	2.8	G	2	RB
98B	*Not found*										-
99	*S. glomulifera*	M	20	12	90	100	10.8	3.3	G	2	K
99A	*Morus nigra*	M							Exempt tree	5	RB
99B	*Persea americana*	M	5	6	20	23	2.4	1.8	G – fruit tree	3 (5)	K
99C	*Persea americana*	M	6	6	16	20	2.0	1.7	G – fruit tree	3 (5)	K
99D	*Macadamia tetraphylla*	M	9	12	28	30	3.4	2.0	G – fruit tree	3 (5)	K
100	*S. glomulifera*	M	30	18	102	117	12.2	3.5	G – DW <10%	2	K
100A	*Olea europaea*	M							Exempt tree	5	Ex
101	*S. glomulifera*	M	30	20	117	131	14.0	3.7	G – DW <10%	2	K
102	*Quercus robur*	M	20	24	113	121	13.6	3.6	G – mid canopy branch failures (8), Trunk hollows. DW. Hanger	2D	K
102A	*Camellia sasanqua*	M	5	5	29	40	3.5	2.3	F – multi trunks. Weed covered	3	K

102B	*P. undulatum*	M	8	8	26	27	3.1	1.9	G – ¼ covered with weeds	3	RB
103	*P. undulatum*	M	10	8	39	42	4.7	2.3	G	2	RB
104	*P. undulatum*	M	7	8	29	30	3.5	2.0	F – suppressed form by T 102 & 103	3	RB
105	*E. saligna*	M	20	8	66	69	7.9	2.8	F – hanger, dead branch at 4 & 6m.	2D	K
106	*E. saligna*	M	25	20	200	180	15.0	4.2	P – termites, 2 major trunk failures, trunk injury @ 7m with decay. Only small canopy remaining.	4D	K
107	*S. glomulifera*	M	12	8	40	44	4.8	2.3	G	2	RB
107A	*Michelia figo*	M	7	7	45	68	5.4	2.8	F – weed covered	3	K
107B	*P. undulatum*	M	8	10	27	30	3.2	2.0	G	2	RB
107C	*S. glomulifera*	M	8	5	22	32	2.6	2.1	G. Privet beside (Noxious weed)	2	K
107D	*L. sinense*	M							Noxious weed - Exempt	5	Ex
107E	*L. sinense*	M							Noxious weed - Exempt	5	Ex
107F	*L. sinense*	M							Noxious weed - Exempt	5	Ex
107G	*Brachychiton x acerifolius*	M	6	3	14	15	2.0	1.5	G	2	K
108	*P. undulatum*	M	10	8	31	40	3.7	2.3	G – suppression to W	3	K
109	*P. undulatum*	M	9	6	58	62	7.0	2.7	G – suppression to E	3	K
110	*S. glomulifera*	M	8	6	39	40	4.7	2.3	G – suppression to E	3	K
111	*E. saligna*	M	25	10	56	62	6.7	2.7	G	2	K

112	*S. glomulifera*	M	16	12	127	127	15.0	3.7	G – DW <10%. Suppression to S	3	K
113	*S. glomulifera*	M	20	16	117	114	14.0	3.5	G – suppression to N & S	3	K
114	*S. glomulifera*	M	18	18	200	158	15.0	4.0	G – suppression to N	3	K
115	*E. saligna*	M	20	16	110	115	13.2	3.5	G	2	RB
115A	*E. saligna*	M	9	2	15	18	1.8	1.6	G	2	RB
115B	*Salix babylonica*	M	5	5	19	24	2.3	1.8	F	3 (5)	Ex
116	*S. glomulifera*	M	10	10	59	64	7.1	2.7	G	2	K
117	*Cupressus sempervirens*	M							Exempt	5	K
117A	*Dead*	D							Exempt	5	Ex
118	*Pinus radiata*	M							Exempt	5	Ex
118A	*P. undulatum*	M	7	5	18	23	2.2	1.8	G	2	K
118B	*L. lugustrum*	M							Noxious weed - Exempt	5	Ex
119	*Acmena smithii*	M	16	16	59	67	7.1	2.8	G	2	K
120	Not found										
121	Not found										
122	*Dead tree*	D							Exempt	5	Ex
122 (area)	*L. sinense*	M							Noxious weed - exempt	5	Ex
123	*Phoenix dactylifera*	M	9	5	38	45	4.6	2.4	G	2	K
123A	*Schinus molle*	OM	8	12	66	79	7.9	3.0	P – ½ dead	4A	RB, also structurally defective
123B	*L. lucidum*	M							Noxious weed - exempt	5	Ex

123C	*L. lucidum*	M							Noxious weed - exempt	5	Ex
123D	*L. sinense*	M							Noxious weed - exempt	5	Ex
123E	*Camellia sasanqua*	M	5	6	39	50	4.7	2.5	G	2	K
123F	*L. lucidum*	M							Noxious weed - exempt	5	Ex
123G	*L. lucidum*	M							Noxious weed - Exempt	5	Ex
123H	*Camellia sasanqua*	M	6	7	30	40	3.6	2.3	G	2	K
123I	*L. lucidum*	M							Noxious weed - Exempt	5	Ex
123J	*P. undulatum*	M	6	4	12	19	2.0	1.6	F – leaning at 45 degrees & suppressed	4C	RB
124	*Laurus nobilis*	M	12	12	52	56	6.2	2.6	P – ½ dead	4A	K
125	*Lagerstroemia indica*	M	7	8	46	60	5.5	2.7	G	2	K
126	*Lagerstroemia indica*	M	8	8	28	34	3.4	2.1	G	2	K
127	*Phoenix dactylifera*	M	12	6	47	55	5.6	2.6	G	2	K
128	*Toona ciliata*	M	18	18	60	70	7.2	2.8	G	2	K
128A	*Dead tree*	D							Dead - exempt	5	Ex
129	*S. glomulifera*	M	18	12	50	58	6.0	2.6	F – G. DW & some canopy suppression	3	K
129A	*S. glomulifera*	M	12	5	25	29	3.0	2.0	F – G. DW <10%. Suppressed	3	K

130	*S. glomulifera*	M	18	18	90	98	10.8	3.3	G – DW <10%. Suppressed	2	K
130A	*Dead*	D							Dead tree covered in Ivy, Exempt	5	Ex
131	*Not found*										
131A	*Eucalyptus sp.*	M	25	12	68	77	8.2	3.0	F – G. DW <10%, Dead branch stub at 7m. Self-correcting trunk	3	K
132	*E. globoidea*	M	26	18	66	76	7.9	2.9	F – DW <10%	3	K
132A	*S. glomulifera*	M	16	8	45	60	5.4	2.7	F – DW <10%, Suppressed form	3	K
133	*P. undulatum*	M	8	6	34	45	4.1	2.4	F – suppressed from	3	K
134	*Pinus radiata*	M							Exempt tree - St	5	K
134A	*P. undulatum*	M	5	3	15	17	2.0	1.6	G - St	2	K
134B	*P. undulatum*	M	4	3	14	15	2.0	1.5	G – St	2	K
135	*S. glomulifera*	M	16	12	85	95	10.2	3.2	G - St	2	K
136	*S. glomulifera*	M	9	3	32	48	3.8	2.4	G – St	2	K
136A	*Pinus radiata*	M							Exempt tree – St	5	K
137	*E. saligna*	M	9	4	28	30	3.4	2.0	P form – OHPL pruning – St	3	K
137A	*Dead tree*	D							Dead – exempt - St	5	Ex
137B	*E. paniculata*	M	5	2	19	20	2.3	1.7	F – P, OHPL pruning – St	3	K
137C	*Dead tree*	D							Dead – exempt – St	5	Ex
137D	*S. glomulifera*	M	5	2	20	22	2.4	1.8	F – P, OHPL pruning – St	3	K
137E	*S. glomulifera*	M	5	2	16	20	2.0	1.7	F – P, OHPL pruning - St	3	K

137F	*S. glomulifera*	M	5	2	16	19	2.0	1.6	F – P, OHPL pruning – St	3	K
137G	*P. undulatum*	M	5	4	17	20	2.0	1.7	F – P, OHPL pruning – St	3	K
138	*Cinnamomum camphora*	M							Exempt tree – St	5	K
138A	*P. undulatum*	M	6	6	18	21	2.2	1.7	F - OHPL pruning – St	3	K
138B	*Cinnamomum camphora*	M							Exempt tree – St	5	K
139	*P. undulatum*	M	8	8	26	30	3.1	2.0	F – weed covered	3	K
140	*S. glomulifera*	M	8	6	29	40	3.5	2.3	F – P, OHPL pruning – St	3	K
140A	*S. glomulifera*	M	8	6	29	40	3.5	2.3	F – P, OHPL pruning – St	3	K
141	*Acmena smithii*	M	7	5	29	27	3.5	1.9	F – climber in canopy	3	RB
142	*L. lucidum*	M							Exempt tree	5	Ex
143	*L. lucidum*	M							Exempt tree	5	Ex
143A	*Acacia decurrens*	M	6	6	32	35	3.8	2.1	P – ½ dead	4A	RB, also structurally defective
143B	*Casuarina torulosa*	M	5	3	12	20	2.0	1.7	F – P, OHPL pruning - St	3	K
143C	*Dead tree*	D							Dead tree - exempt	5	Ex
144	*L. lucidum*	M							Noxious weed - Exempt	5	Ex
145	*P. undulatum*	M	5	6	19	21	2.3	1.7	G - St	2	K
146	*Not found*										
147	*P. undulatum*	M	7	8	41	46	4.9	2.4	G - St	2	K
148	*P. undulatum*	M	7	5	22	25	2.6	1.8	G - St	2	K

149	*Pinus radiata*	M	10	8	30	38	3.6	2.2	Exempt tree	5	K
149A	*P. undulatum*	M	7	4	21	22	2.5	1.8	G	2	K
149B	*P. undulatum*	M	5	3	14	15	2.0	1.5	G	2	K
150	*E. paniculata*	M	7	4	26	30	3.1	2.0	F – P, OHPL pruning - St	3	K
151	*P. undulatum*	M	8	8	21	28	2.5	1.9	F – P, OHPL pruning – St	3	K
152	*P. undulatum*	M	8	8	42	51	5.0	2.5	F – P, OHPL pruning – St	3	K
153	*Dead tree*	D							Exempt	5	Ex
154	*Pinus radiata*	M							Exempt - St	5	Ex
155	*P. undulatum*	M	6	6	22	40	2.6	2.3	G - St	2	K
156	*E. paniculata*	M	6	6	38	44	4.6	2.3	P form – lots epicormic - St	4C	K
157	*E. paniculata*	M	16	12	52	60	6.2	2.7	G - St	2	K
158	*E. paniculata*	M	6	1	26	30	3.1	2.0	F – P, OHPL pruning - St	3	K
158A	*Acacia decurrens*	M	4	3	15	16	2.0	1.5	G - St	2	K
159	*Not found*										
160	*Pinus radiata*	M							Exempt tree	5	Ex
161	*Pinus radiata*	M							Exempt tree	5	Ex
161A	*P. undulatum*	M	5	3	10	14	2.0	1.5	F	3	RB
161B	*L. lucidum*	M							Exempt tree	5	Ex
162	*S. glomulifera*	M	10	6	32	35	3.8	2.1	F – suppressed form	3	K
163	*Not found*										
163A	*L. lucidum*	M							Exempt tree	5	Ex
163B	*P. undulatum*	M	6	6	21	24	2.5	1.8	G	2	RB
164	*Dead tree*	D							Exempt tree	5	Ex

165	*Dead tree*	D							Exempt tree	5	Ex
166	*Not found*										
166A	*S. glomulifera*	M	8	4	22	30	2.6	2.0	P form suppressed	3	RB
167	*P. undulatum*	M	7						Blown over	4D	RB, also structurally defective
168	*Pinus radiata*	M							Exempt tree - St	5	Ex
169	*S. glomulifera*	M	8	5	35	50	4.2	2.5	G, OHPL pruning (topped) – St	3	K
170	*S. glomulifera*	M	6	4	34	50	4.1	2.5	G, OHPL pruning (topped) – St	3	K
170A	*Not found*										
171	*S. glomulifera*	M	10	8	45	52	5.4	2.5	G	2	K
171A	*P. undulatum*	M	7	5	25	27	3.0	1.9	G	2	K
171B	*P. undulatum*	M	3	2	21	24	2.5	1.8	P form	3	K
171C	*Acmena smithii*	M	5	3	16	17	2.0	1.6	G	2	K
171D	*Dead tree*	D							Exempt tree	5	Ex
172	*Pinus radiata*	M							Exempt tree	5	Ex
173	*Pinus radiata*	M							Exempt tree	5	Ex
173A	*P. undulatum*	M	5	6	22	26	2.6	1.9	F - G	3	RB
174	*Dead tree*	D							Exempt tree	5	Ex
175	*Dead tree*	D							Exempt tree	5	Ex
176	*Dead tree*	D							Exempt tree	5	Ex
176A	*L. lucidum*	M							Noxious weed - Exempt	5	Ex
177	*Dead tree*	D							Exempt tree	5	Ex

Terms used in Tree Survey & Report:
Age Class
(Y) – Young refers to a well-established but juvenile tree. Less than 1/3 life expectancy
(SM) – Semi-mature refers to a tree at growth stages between immaturity and full size. A tree has reached First Adult Form i.e. displays adult characteristics. 1/3 to 2/3 life expectancy
(M)- Mature refers to a full-size tree with some capacity for future growth. Older than 2/3 life expectancy
(OM) – Over-mature refers to a tree approaching decline or already declining. Older than 2/3 life expectancy and showing signs of irreversible decline.

Health refers to a tree's vigour, growth rate, disease and/or insects.
Vitality summarises observations about the health and structure of the tree on a scale of: **(G) Good, (F) Fair, (P) Poor, (P) Poor & (D) Dead.**
Good: Tree is generally healthy and free from obvious signs of structural weaknesses or significant effects of pests and diseases or infection;
Fair: Tree is generally vigorous although has some indication of being adversely affected by the early effects of disease or infection or environmental or mechanical damage. Appropriate tree maintenance can usually improve overall health and halt decline;
Poor: Tree in decline and is not likely to improve with reasonable maintenance practices or has a structural fault such as bark inclusion;
Dead: Tree no longer capable of sustained growth.
Deadwood (DW) – deadwood found in canopy as a percentage.
Over Head Power Lines (OHPL) – upper canopy pruned to accommodate power lines at a given height.

Next door tree (ND) – tree located in the adjoining site.

Height expressed in metres refers to estimated overall height of tree.

Spread expressed in metres refers to estimated spread of crown at the drip line.

(DBH) Diameter at Breast Height expressed in millimetres refers to the trunk diameter at 1.4 metres above ground level. Where there are multiple trunks the combined diameter has been calculated in terms of Appendix A – AS 4970 – 2009, shown in brackets.

(DRB) Diameter above Root Buttress expressed in millimetres refers to the trunk diameter above root buttress.

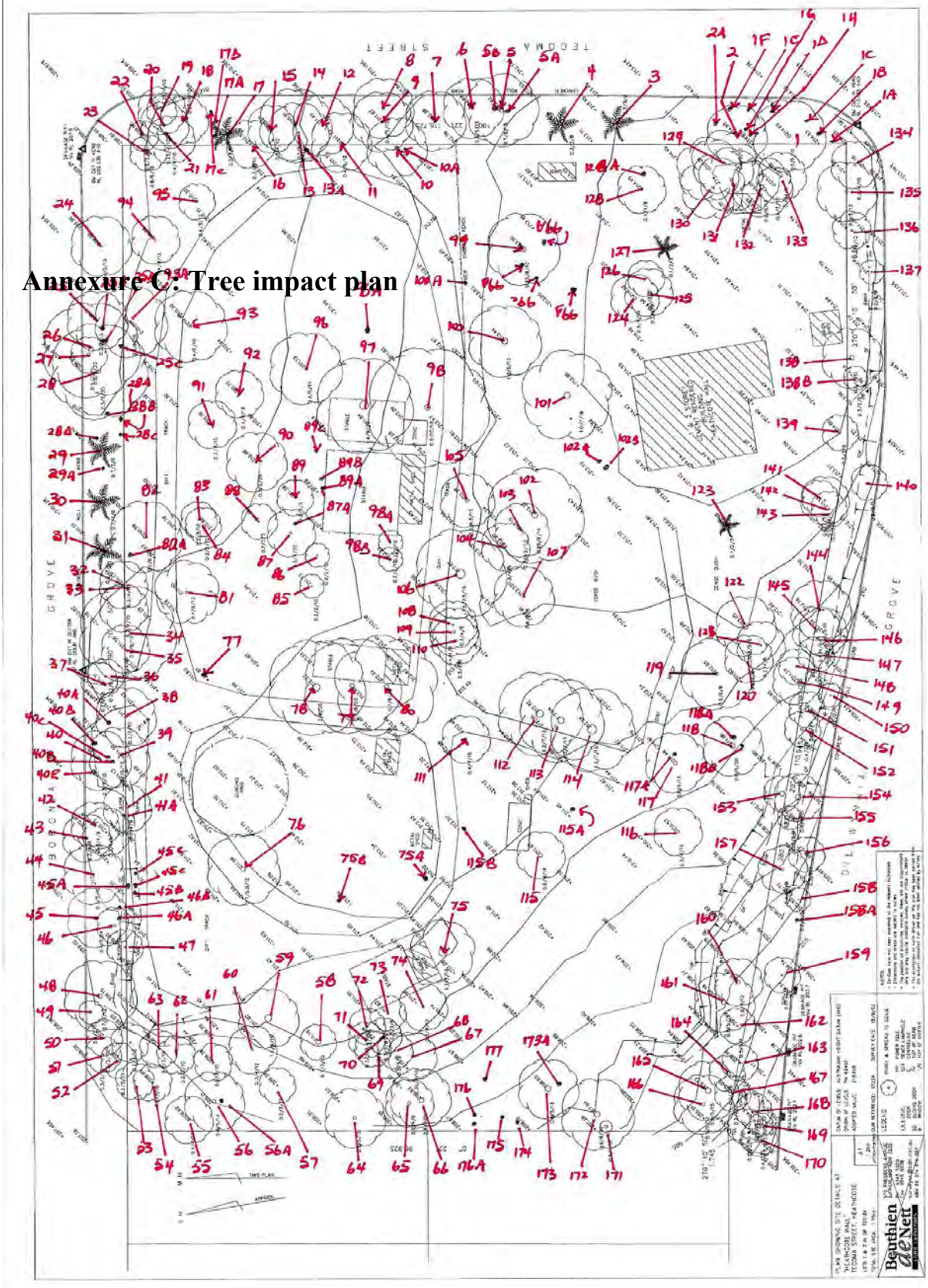
(TPZ) Tree Protection Zone & Structural Root Zone (SRZ) as defined by AS 4970 – 2009 Section 3

(ULE) The various ULE categories indicate the useful life anticipated for an individual tree or trees assessed as a group. Factors such as the location, age, condition and vitality of the tree are significant to the determination of this rating. Other influences such as the tree's effect on better specimens and the economics of managing the tree successfully in its location are also relevant to ULE (Barrell 1993, 1995, 2001).

ULE RATING (UPDATED 1/4/01) BARRELL

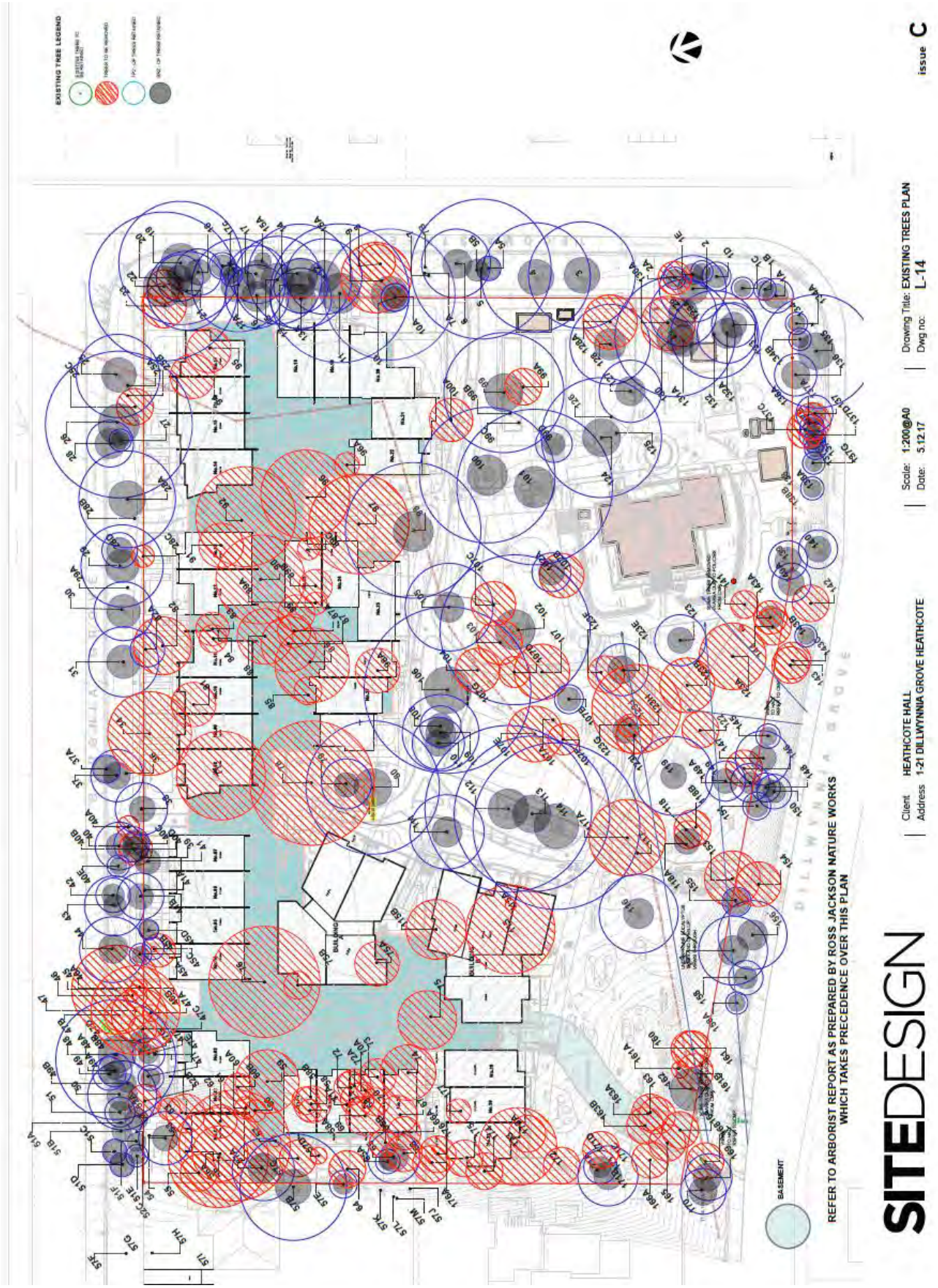
1.Long ULE: Trees that appear to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	**2.Medium ULE:** Trees that appear to be retainable at the time of assessment for more than 15-40 years with an acceptable level of risk.	**3.Short ULE:** Trees that appear to be retainable at the time of assessment for more than 5-15 years with an acceptable level of risk.	**4.Remove:** Trees that should be removed within the next 5 years.	**5.Small, young or regularly pruned:** Trees that can be reliably moved or replaced.
(A) Structurally sound trees located in positions that can accommodate future growth	**(A)** Trees that may only live between 15 and 40 more years.	**(A)** Trees that may only live between 5 and 15 more years.	**(A)** Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.	**(A)** Small trees less than 5 Metres in height.
(B) Trees that could be made suitable for retention in the long term by remedial tree care.	**(B)** Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.	**(B)** Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.	**(B)** Dangerous trees because of instability or recent loss of adjacent trees.	**(B)** Young trees less than 15 years old but over 5 metres in height.
(C) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	**(C)** Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	**(C)** Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	**(C)** Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.	**(C)** Formal hedges and trees intended for regular pruning to artificially control growth.
	(D) Trees that could be made suitable for retention in the medium term by remedial tree care.	**(D)** Trees that require substantial remedial tree care and are only suitable for retention in the short term.	**(D)** Damaged trees that are clearly not safe to retain.	
			(E) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	
			(F) Trees that are damaging or may cause damage to existing structures within 5 years.	
			(G) Trees that will become dangerous after removal of other trees for the reasons given in (A) to (F).	
			(H) Trees in categories (A) to (G) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.	

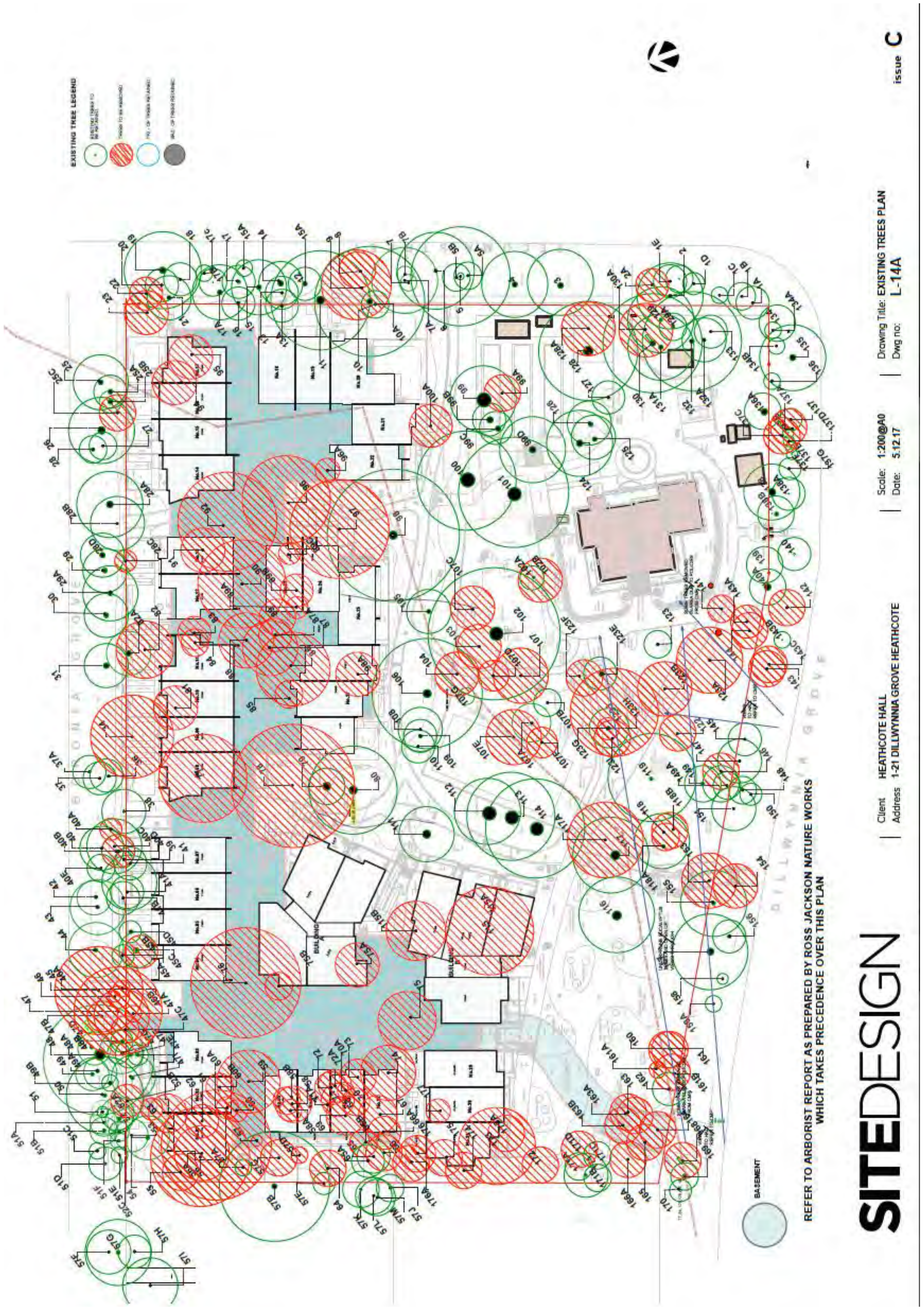
Annexure B: Tree location plan (hand marked by JNW)



Annexure C: Tree impact plan

Annexure C: Tree impact plan




EXISTING TREE LEGEND
BASEMENT
REFER TO ARBORIST REPORT AS PREPARED BY ROSS JACKSON NATURE WORKS
WHICH TAKES PRECEDENCE OVER THIS PLAN
SITEDESIGN
Client HEATHCOTE HALL
Address 1-21 DILLWYNNIA GROVE HEATHCOTE
Scale: 1:200@A0
Date: 5.12.17
Drawing Title: EXISTING TREES PLAN
Dwg no: L-14A
issue C

30

Annexure D: Typical trunk protection

Construction & Environmental Management Plan

Heathcote Hall Development

1-21 Dyllwynnia Gr, Heathcote

Revision	Status	Date
A	For DA Submission	1st December 2017

Table of Contents

Issue Register

Employee Name	Employee Signature	Date
Robert Orth		1/12/17

1. Introduction

This Construction & Environmental Management Plan (CEMP) has been developed for inclusion in the State Significant Development Application (SSDA) to address the construction items related to the proposed development at Heathcote Hall, 1-21 Dyllwynnia Grove, Heathcote. In due course, the CEMP will address the Development Consent conditions imposed in relation to construction and development works at HEATCHOTE HALL.

In addition, the CEMP outlines the actions and staging of construction deemed necessary to address the concerns of neighbouring properties and authorities whilst maintaining a safe and productive construction site.

The CEMP is a positive commitment by Fuzortinn to ensure that the statuary obligations are fulfilled and that the project is delivered to the highest Fuzortinn quality, safety and environmental standards.

The responsibility for the management of this document and the actions contained therein lies with the Construction Manager for the Project. The CEMP will be monitored throughout the project construction phase until such time as all actions on the CEMP Action List are completed.

1.1 Project Overview

The Heathcote Hall site is strategically located approximately 20km south of the Sydney CBD, 20km north of Wollongong and within 500m of Heathcote Railway Station. The site, with an overall area of some 1.7 hectares, is located within the Sutherland Shire local government area (LGA). Refer to Figure 1 below for a graphic representation of the site location and context.

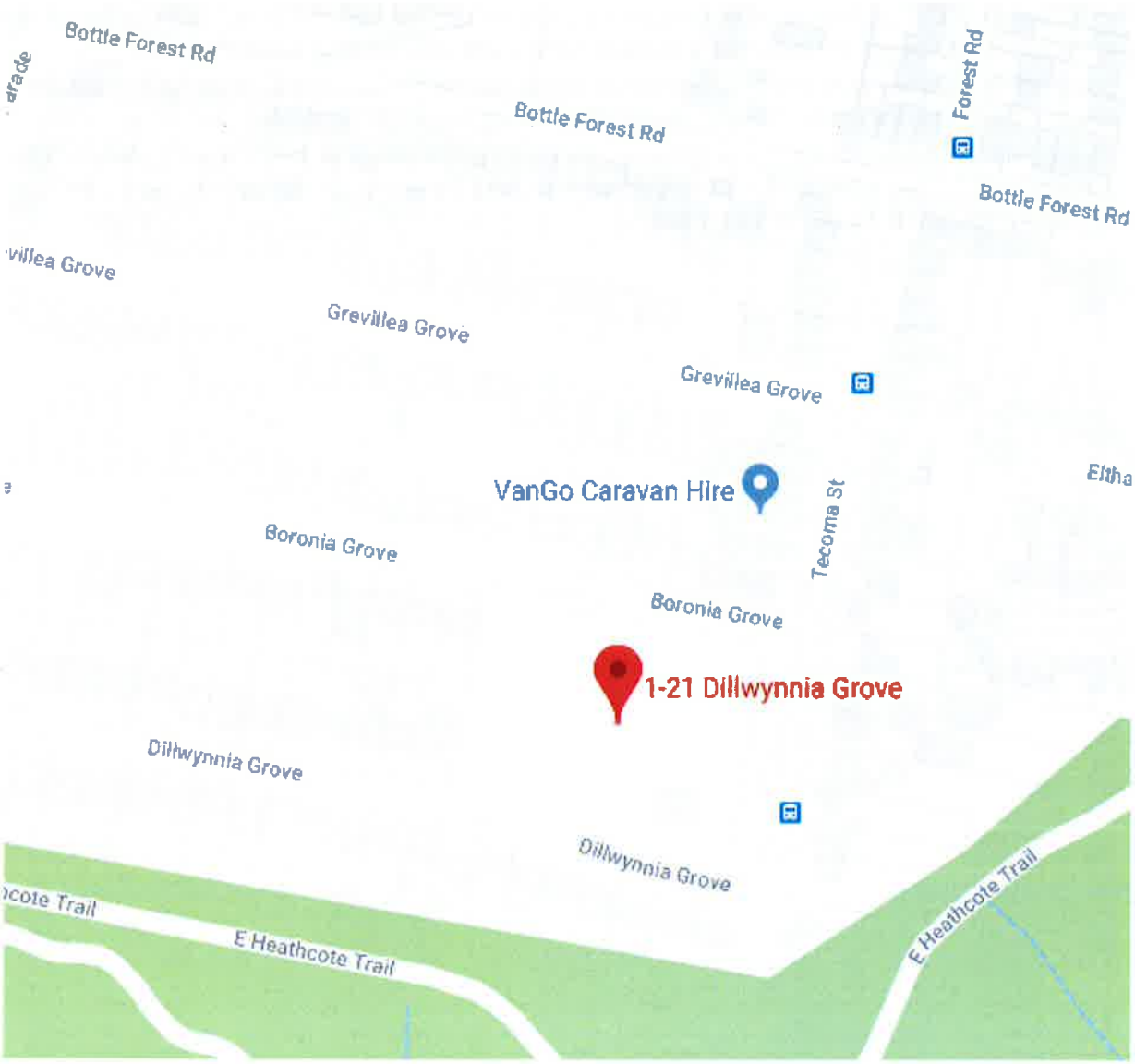


Figure 1: Site Location

Figure 2 provides an aerial image of the HEATCHOTE HALL site.

A summary of the proposed development is detailed as follows:

- Construction of a two level basement carpark for both residents and visitors of the site.
- Construction of thirty five (35) two (2) storey townhouses.
- Construction of two (2) three (3) storey walkup unit blocks containing a total of twenty (20) units.
- Restoration and adaptive re-use of the existing Heathcote Hall and surrounding pleasure gardens.
- Extension and augmentation of physical infrastructure / utilities for the development, including provision of new substation.

Figure 2: Aerial View of the site

1.2 Hours of Work

The anticipated hours of work pending Authority approval for construction works, including the delivery of materials to and from the sites within the precinct, are as follows:

- Between 7:00 am and 5:00 pm, Mondays to Fridays inclusive.
- Between 7:00 am and 3:00 pm, Saturdays.
- No work will be carried out on Sundays and Public Holidays.

Works outside these times are subject to agreement and approval by Council or the relevant approving authority.

1.3 Contact Details

The Construction Manager for the Project is Nathan Fuz. Contact details are listed below.

M: 0410 570071; E: nathan@cdcommercial.com.au

2 CEMP 'Action List'

The "CEMP Action List" forms the basis of the HEATCHOTE HALL CEMP. The Action List responds to a series of anticipated DA conditions that are to be addressed prior to and during the construction phase of the project. They further address any Authority requirements as well as taking into consideration the concerns of neighbouring building occupiers.

The Action List provides a means by which responsibilities of the project team can be readily identified and monitored.

In addition to the Action List are a series of attachments which contain more detailed information in the form of checklists, registers, templates and reports. The attachments contain the information and tools that must be implemented during the construction phase in order to close out the specific items and ultimately satisfy the DA conditions associated with the project.

3 Traffic Management Plan

3.1 Introduction

McLaren Traffic Consultants have been engaged as the traffic management consultant for the project and they will compile a Traffic Management Plan (TMP) for the HEATCHOTE HALL precinct.

The traffic management plan for the project shall deal with the issues of construction traffic, their effect on the surrounding environment and be prepared prior to the issue of the Construction Certificate.

3.2 Access and Egress to site

Vehicles

During mobilisation and site excavation, construction related traffic will enter the site primarily off Dyllwynnia Grove and exit primarily via Boronia Grove. This will allow sharing of vehicle movements between the two main access roads as well as assist in avoiding congestion. Refer to attached Access and Egress Plan – Appendix A.

Exit points on each site will be manned by qualified Traffic Controllers who will be responsible for managing both vehicular and pedestrian traffic movements.

A A-Class hoarding will be erected around the perimeter of the site and will be capable of having graphics installed.

Public Transport Access

All site workers and visitors to site shall be actively encouraged to take public transport to and from the site. Heathcote train station is located within 500 metres from the site and will enable the majority of site workers to travel by train.

Pedestrians

All site workers and visitors shall enter and exit the sites via one of the following entry/exit points:

- Secured door to Site Compound on Tacoma Rd..

3.3 Loading and Unloading of Materials

There will be several designated areas for deliveries and the loading / unloading of materials on the site. Refer to Appendix A.

- All loading and unloading operations are to comply with statutory requirements;
- No materials will be stored on public footpaths or roads;
- All entering and exiting of vehicles to work zones shall be supervised by a Traffic Controller. Flow to all lanes of Traffic shall remain mostly unimpeded in accordance with Council and DA requirements.
- Should any lane closures be required, a relevant traffic management plan will be compiled along with any required permits and stakeholders / residents notified where required.
- As noted above, these points are all subject to Council and Authority approval and, these proposals may require amendment prior to the works being undertaken.

3.4 Truck and Vehicle Routes:

The routes for all trucks and vehicles proceeding to and exiting from the sites within the precinct is identified in Appendix A.

All major deliveries will enter and exit the HEATCHOTE HALL via main arterial roads. Signage will be installed within the precinct to direct all deliveries to the correct area.

3.5 Disruption to Traffic Flows

The primary goal of the TMP will be to mitigate any disruptions to traffic flow within HEATCHOTE HALL and in the surrounding areas. Trucks and vehicles using Dyllwynnia and Boronia Groves must be marshalled within the site boundaries and will not be permitted to stop or wait in either roadway prior to entering site.

All non-critical deliveries will be scheduled outside peak traffic periods where possible.

3.6 Pedestrian and Traffic Management

Signage will be established at the precinct entry and exit points to alert pedestrians and other drivers to the movement of construction traffic. Where required, traffic control personnel will control the movement of large vehicles to and from the sites.

Visitors to the sites will be escorted at all times by Fuzortinn Site Staff and will be provided with a defined entry path from the point of entry.

3.7 Site Safety Plan

A Fuzortinn Site Specific Workplace Risk Management Plan (WRMP), will be implemented prior to the commencement of construction and be updated from time to time to reflect the current stage of site works.

All works throughout the construction process will be required to comply with the TMP, Statutory Requirements, and the Fuzortinn WRMP.

3.8 Site Specific Issues

3.8.1 Public Pedestrian Access

Pedestrian access and movement within HEATCHOTE HALL will be of high importance during all stages of construction. Pedestrian access routes will be identified and highlighted in the TMP. All pedestrian routes shall be clearly defined with signage and delineated from vehicular traffic routes where required.

3.9 Construction Staging, Description and Duration

The following is a summary of the proposed construction staging and estimated durations for the project;

Element	Description	Duration
1. Site Establishment	Set up hoardings and site amenities	1 month
2. Earthworks	Foundation Piling, bulk excavation and detailed excavation	3 months
3. Construction	Construction of townhouses and residential flat buildings including refurbishment and adaptive reuse works to Heathcote Hall.	18 months

3.10 Plant & Equipment

The following is a summary of the types of plant and equipment that will be utilized on the project:

- Articulated flatbed truck for delivery of site sheds and hoarding materials.
- Articulated float / low loader for delivery of earth moving equipment such as excavators, dozers, dump trucks and piling rigs.
- Truck and trailers for the exportation of excavated material off site.
- Concrete trucks for delivery of ready mix concrete.
- Mobile cranes, of various size, for erection of site amenities, tower cranes and miscellaneous lifting.
- Prime mover and enclosed flatbed trailer for delivery of materials.
- Medium rigid vehicles, small rigid vehicles, vans and couriers to deliver smaller materials.

3.11 Truck Movements

- Export off site of excavated materials by truck and trailer for Building 2.
- Concrete trucks for piling / construction of basement walls.

4 Construction Waste Management Plan

A Waste Management Plan will be developed if required. for the removal of waste generated by construction works on site. Periodic review of this waste management plan will be undertaken to ensure continual compliance with environmental regulations and standards. Waste types likely to be generated on the site include the following:

- General Waste;
- Putrescible waste (lunch room waste from site personnel);
- Cardboard & White Paper (amended plans & drawings);
- Bottles, Cans & Plastics;
- Steel / Concrete / Bricks / Tiles / Timber & Gyprock.

The waste subcontractor will supply builder's waste bins for the onsite collection and storage of general waste material.

Upon arrival at the facility, the waste is sorted into various categories. Once the product has been sorted into its various categories, the facility then processes the individual recyclable waste streams into reusable products available for re-sale to the public as described below:

- Concrete is crushed, pulverized and sold as recycled aggregate;
- Bricks are also crushed, pulverized and sold as recycled road base;
- Timber is chipped and sold as mulch for garden beds and ground cover;
- Steel is sent to either Metalcorp or Simsmetal for recycling;
- Plasterboard is broken down to a gypsum product and sold to farmers as a soil additive;
- Cardboard & White Paper Recycling to Amcor for recycling;
- Bottles, Cans & Plastics Recycling to Visy for recycling.

Waste generated at the workplace shall be avoided or recycled wherever practical. Fuzortinn will implemen a Waste Management Plan and it is described as follows:

- material is reused wherever practicable, in particular top soil
- the establishment of a workplace waste management area(s) for sorting and segregating waste where available space allows;
- participation in waste minimisation training for all workplace personnel;
- recyclable materials are reprocessed wherever practicable, e.g. plasterboard off cuts, steel reinforcement and concrete;
- contractors identify areas where they can reduce waste and reuse materials in their respective trades (waste avoidance initiatives to be provided by each Service Provider in the JSEA);
- prescribed waste, e.g. hazardous or contaminated material, asbestos, aqueous waste (paint washout residue/sludge), shall be removed by a licensed contractor and dockets retained at the workplace for audit verification purposes;
- pollution and damage to the environment is prevented; and
- The safety and health of employees, Service Providers and the public is protected.

The figure below details the general principles for prevention of waste.

Figure 3: Waste prevention principles

5 Erosion & Sediment Control

An Erosion and Sediment Control Plan will be implemented on the project.

Below are items that as a minimum will be included in the Erosion and Sediment Control Plan:

- All stormwater pits around the perimeter of the site will be covered using filter fabric and sand bags.
- Filter fabric and sand bags shall also be installed around piling activities which are adjacent to public roadways or pedestrian footpaths in order to contain spoil arisings. These shall be regularly maintained to ensure no spoil or concrete migration onto public areas.
- During excavation, a wash down facility will be installed to wash down the tyres and wheel arches of any trucks exiting the excavation zone.
- All construction work zones and loading areas that are trafficked by vehicles are to be regularly swept / washed-down to maintain a clean surface and keep surrounding roads clean.
- Stockpiling of excavated material shall be carried out in a manner to limit sediment migration and water run-off. Stockpiled material to be appropriately covered where deemed necessary to prevent erosion and / or odour migration.
- The use of temporary sediment / silt fencing to ensure erosion and sediment particles do not enter public access ways or surrounding waterways.
- Vehicles leaving the site will secure and cover their loads. All trucks will be inspected prior to leaving the site (where applicable)
- All roads and pedestrian footways surrounding the site will be swept clean as required to remove any debris associated with the works on the site.
- A Dewatering Management Plan shall be compiled to outline the requirements for dewatering and any water treatment that may be required. Following any required treatment of water and verification testing, it shall be pumped to sewer and/or stormwater in accordance with Office of Water and Sydney Water requirements.

7 Air Quality

Air quality monitoring will be carried out if required throughout the excavation phase of the Project. This will be limited to excavation phases of the Project with additional monitoring required being assessed on a monthly basis.

Dust created by construction related activities, typically becomes more prominent during windy conditions, and will be dealt with by way of water suppression. Other measures for dust suppression include:

- Stockpiles of spoil to be covered and/or emulsion spray added to stockpile;
- In windy conditions, the frequency of water suppression will be increased;
- The construction site will be maintained and kept clean. Where suitable, the use of mechanical sweepers and covered waste bins will be utilised;
- Completed surfaces will be kept clean;
- Controlled site access will be maintained with vehicle wash down / clean down facilities to be established to maintain access roads;
- All materials transported from site in trucks will be appropriately covered.

8 Workplace Risk Management

8.1 Introduction

Fuzortinn is fully committed to providing a safe working environment. Each Work Place Risk Management Plan (WRMP) requires that equipment, workplaces and practices comply with relevant regulations and standards. Regular and ongoing reviews of these standards will be conducted and where higher standards are practical and desirable, they will be adopted. In addition the company will:

- Provide adequate resources to satisfy this policy.
- Identify, control and reduce work-related hazards and risks that may produce injury, illness or asset damage.
- Identify, quantify and control to safe levels, those chemicals and physical agents in the workplace capable of causing ill health.
- Promote environmental, health, safety and the welfare of employees and sub-contractors while respecting the privacy of individuals.
- Provide information, instruction and training for employees to increase their personal understanding of workplace hazards, promote safe working practices and ensure contractors are aware of and satisfy the Groups HSE expectations.
- Consult employees and contractors in environmental, health and safety to reduce workplace hazards and risks.
- Consult with clients, industry bodies and others in the development of appropriate standards, control strategies and monitoring techniques, which comply, with the requirements of statutory authorities.
- Set short and long term goals in occupational health and safety management, and review performance against these goals.

Fuzortinn Management is responsible for raising the awareness of the responsibilities of all workers on the site in regards to workplace safety and the role they play in achieving a safe and healthy work environment. Fuzortinn employees and all other workers on the premises or site are responsible for working towards achieving and maintaining a healthy and safe workplace. The intent of this policy is to foster a culture within Fuzortinn employees and its subcontractors, raising health and safety awareness, and promoting active participation in the Health Safety and Environment (HSE) program.

8.2 Workplace Risk Management Plans (WRMP) and Job Safety & Environment Analysis (JSEA)

A key tool in the management of HSE on the project will be the continued improvement of both Fuzortinn's WRMP and each individual Job Safety & Environment Analysis (JSEA). This plan as a minimum includes the following:

- A description of the work to be undertaken;
- An identification of the foreseeable hazards associated with the works; and
- A description of the hazard control measures to be used.

A detailed site specific Workplace Risk Management Plan shall be developed and implemented by Fuzortinn prior to commencement of works and shall be updated as / when required.

9 Site Management Plan

9.1 Introduction

A Site Management Plan will be developed to outline the proposed phases of the construction work on site, outline the order of works, and assess Fuzortinn's impact and interaction with the surrounding community.

9.2 Construction Phases

The works have been broadly divided into the following phases:

a. Site establishment;
b. Civil - excavation, piling and ground retention works;
c. Remediation works to site; (if required)
d. Structure;
e. Façade & atrium roof works;
f. Building fit out and finishes;
g. Commissioning & handover works;
h. Landscaping and public domain works.

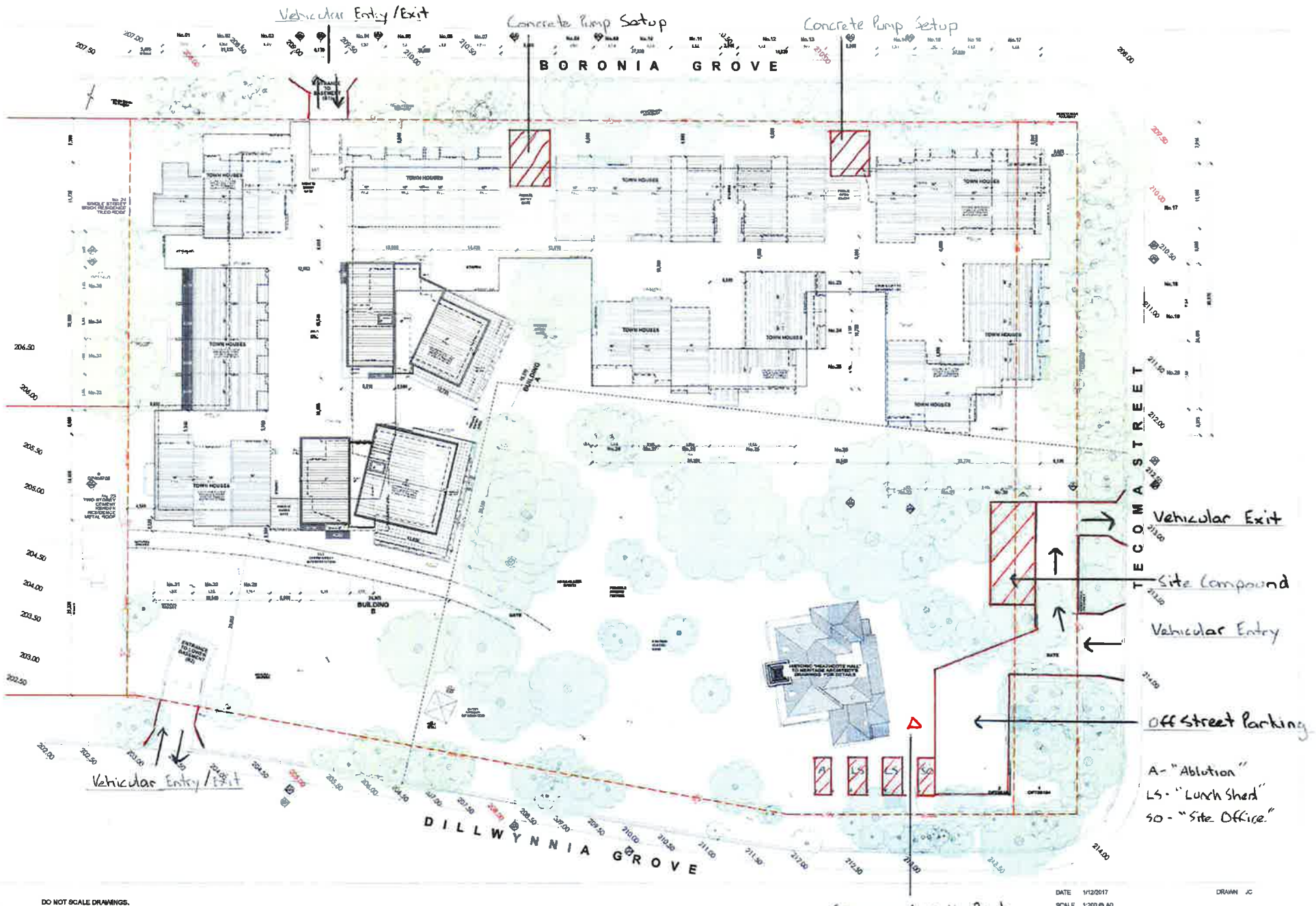
9.3 Fire Protection Measures During Construction

Fuzortinn will comply with the requirements of the BCA and Australian standards during excavation and construction.

Specifically, E1.9 of the BCA requires the following:

- not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each *storey* adjacent to each *required exit* or temporary stairway or *exit*.

Appendix A:
Site Establishment Plan



N

DO NOT SCALE DRAWINGS.
VERIFY ALL DIMENSIONS ON SITE.
REFER ANY DISCREPANCIES TO THE SUPERINTENDENT BEFORE PROCEEDING WITH THE WORK.

FUZORTINN PTY LTD

PROPRIETOR

HISTORIC HEATHCOTE HALL

1-21 Dillwynnia Grove,
Heathcote Sutherland

Site Plan

IA ARCHITECTS
Suite 202, 23 Chandos Street
St Leonards, NSW 2065
P: 02 9009 4400
E: admin@iakarchitects.com.au

DATE 1/12/2017
SCALE 1:200 @ A0
DRAWN JC

PROJECT NO.	DRAWING NO.	ISSUE
IA1633	DA01	A

A0

Land & Groundwater Consulting Pty Ltd
ABN 65 162 117 928

Fuzortinn

Detailed Environmental Site Investigation Report

1-21 Dillwynnia Grove
Heathcote, NSW

4 January 2018

www.lgconsult.com.au

Fuzortinn

Detailed Environmental Site Investigation Report

1-21 Dillwynnia Grove
Heathcote, NSW

4 January 2018

Contents

Figures

Attached

Tables

Main Text

Attached

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Project manager:	Gonzalo Parra
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Name of project:	1-21 Dillwynnia Grove, Heathcote, NSW
Name of document:	Detailed Environmental Site Investigation Report
Document version:	Final
Project number:	LG17100.01

Executive Summary

Background

Land & Groundwater Consulting Pty Ltd (LG) has been engaged by Fuzortinn Pty Ltd to undertake a Detailed Environmental Site Investigation (DESI) at the site known as 1-21 Dillwynnia Grove, Heathcote, NSW.

LG understands that the site is proposed for re-development comprising refurbishment and restoration of Heathcote Hall Building; construction of 35 x 2 storey townhouses; construction of 2 x 3 storey apartment buildings with 20 units; construction of a 2-level basement car park; and landscaping including turf renewal and reinstatement of pleasure gardens, pathways, community kitchen gardens and orchard.

Soil samples were collected from 7 testpit and 20 soil bore locations across the site. Samples collected were analysed for total recoverable hydrocarbons (TRHs); benzene, toluene, ethylbenzene and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs); organochlorine pesticides (OCPs); organophosphate pesticides (OPPs); polychlorinated biphenyl (PCBs); metals (arsenic, cadmium, copper, chromium, lead, nickel, mercury and zinc) and asbestos. A total of 2 groundwater wells were installed as part of the DESI works.

Conclusions

Based on the findings of this DESI the following conclusions are provided:

- The surface fill materials comprised sand, gravel and clay with traces of demolition fragments, at the locations investigated. This fill was underlain by natural clay;
- The soils at the locations sampled and analysed did not contain concentrations of TRHs, BTEX, PAHs, OCPs, OPPs, PCBs and heavy metals that were greater than the Residential A and B land use criteria, at the time tested, with the following exceptions;
  - Concentrations of TRH C16-C34 less BTEX (F3) were above the EIL in sample TP3/0.2-0.3. However, further statistical assessment indicated that the isolated occurrence of elevated TRH impact at TP3/0.2-0.3 is not considered significant at the site.
  - Concentrations of chromium were above the HIL A in samples S9 and SH3 and lead concentrations were above the HIL A in samples S10 and SH3. However, it is considered that residential HILs at the site have limited application due to

significant sealing expected on site surfaces and landscaping areas. Also, consideration for remediation drivers would not be required where there is no associated human health risk.

- It is further noted that the vast majority of these soils will be removed during the proposed basement excavation and risks to site occupants and vegetation will be further reduced. Therefore, LG considers that the TRH, chromium and lead impact identified will not adversely affect the suitability of the site for the proposed use.

- Asbestos fibres (amosite and chrysotile) were detected above the HIL A in sample TP5/0.2-0.3, collected within the fill material at Testpit 5;
- Bonded cement fragments collected from surfaces across the site for laboratory verification analysis confirmed the presence of asbestos containing materials in samples PACM1 and PACM2, which can be referred as ACMs; and
- The assessment results indicate that the site subject to this DESI can be made suitable for Residential A and B land use, consistent with a Zone E4 Environmental Living zoning, provided that soils contaminated with asbestos are removed and disposed off-site appropriately.

Recommendations

Based on the conclusions above the following recommendations are provided:

- Remediation and validation works be undertaken, in order to safely remove Asbestos Hotspot TP5/0.2-0.3 and bonded ACMs identified to demonstrate that the remaining excavations and excavated soils meet NSW EPA requirements for Residential A and B land use.

1. Introduction

1.1 Background

Land & Groundwater Consulting Pty Ltd (LG) has been engaged by Fuzortinn Pty Ltd (Fuzortinn) to undertake a Detailed Environmental Site Investigation (DESI) at Lots 1 and 2 in Deposited Plan (DP) 725184, known as 1-21 Dillwynnia Grove, Heathcote, NSW (hereafter referred as 'the site'). The location of the site is shown in **Figure 1**.

This report should be read in conjunction with the following document:

- GHD (2017) *Phase 1 Contamination Assessment, Heathcote Hall Services*. Dated 27 October 2017. Prepared for Fuzortinn Pty Ltd. Ref: 2316195.

The DESI was undertaken with respect to the staged investigation approach outlined in *State Environmental Planning Policy No. 55 - Remediation of Land* (SEPP 55 - Ref 1) and the National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (amended 2013) (NEPC, 2013 - Ref 2).

This report was prepared in general accordance the NSW Office of Environment and Heritage (OEH) *"Guidelines for Consultants Reporting on Contaminated Sites"* (2011).

1.1.1 Proposed Development

LG understands that the site is proposed for re-development comprising the following works:

- Refurbishment and restoration of Heathcote Hall Building;
- Construction of 35 x 2 storey townhouses;
- Construction of 2 x 3 storey apartment buildings with 20 units;
- Construction of a 2-level basement car park for 134 vehicles and 7 motorcycle spaces. Basement car parking accessed from Boronia Grove and Dillwynnia Grove; and
- Landscaping including turf renewal and reinstatement of pleasure gardens, pathways, community kitchen gardens and orchard.

The proposed development plans are provided in **Appendix A**.

1.2 Objectives

The specific objectives of the DESI were to:

- Provide an assessment of potential soil and groundwater contamination resulting from onsite or offsite sources, during past or present activities;
- Investigate the potential areas of environmental concern previously identified by means of targeted sampling and laboratory analysis of relevant contaminants;
- Assess the site suitability for Residential A and B land use; and
- Assess the need for further investigations and/or remedial action, if any.

1.3 Scope of Works

The following works were undertaken to meet the objective described above:

- Reviewed findings from the preliminary investigation undertaken by GHD (GHD, 2017), so that the preliminary findings could be relied upon and used in conjunction with the data generated from this DESI, to assess potential contamination at the site;
- Prepared a sampling and analytical plan for the following areas of environmental concern (AECs):
  - AEC 1: Potential weathering of hazardous building materials, demolition of former stable structures of unknown construction and storage of building materials;
  - AEC 2: Maintenance of vehicles and storage of waste oils;
  - AEC 3: Potential application of pesticides around buildings and former stables; and
  - AEC 4: Imported fill materials of unknown quality, quantity and origin.
- Prepared a health, environment and safety plan (HESP) for all site related activities, to identify the potential risk associated with the works and to document and implement control measures to manage and mitigate the risks;
- Conducted dial before you dig search to assess for the presence of underground services and pipework;

- Undertook field investigations which included the following works:
  - Given that the site covers an area of approximately 17,500 m^2 (1.75 ha), a total of 27 soil sampling locations were investigated in accordance with the Minimum Sampling Points Required for Site Characterisation, published under the NSW EPA (1995) "*Sampling Design Guidelines"* located in a systematic grid pattern across the site with allowance for structural obstacles (e.g. existing buildings and trees);
  - Excavation of 7 testpits systematically located within the western portion of the site (AEC 4), using an excavator;
  - Collection of representative testpit samples of fill materials (i.e. 0.2 to 1.0 m bgs) and natural soils (i.e. 0.5 to 1.5 m bgs) at each of the testpit location and/or at changes in lithology or where visual and/or olfactory indicators of contamination were observed;
  - Completion of detailed environmental logging of each testpit for evidence of contamination (e.g. by reference to staining, odour, presence of materials of anthropogenic materials), fill materials and soil properties;
  - Drilling of 6 boreholes and collection of 2 soil samples (1 at surface and 1 at depth) from each borehole to assess for broad impacts from current and former site uses (AEC's 1, 3 and 4);
  - Installation of 2 groundwater wells to a maximum depth of approximately 7 metres below ground surface (m bgs), to bedrock refusal;
  - Collection of 1 surface sample from a depth no greater than 0.2 m using a shovel or trowel at 4 locations within 1 m of the external walls of Heathcote Hall and associated structures to assess for impacts as a result of the decay of lead based paint, asbestos and other potential hazardous building materials (AEC 1);
  - Collection of 1 surface sample from a depth no greater than 0.2 m using a shovel or trowel at 10 locations across the remainder of the site to assess for broad impacts from current and former site activities (AEC 1, 2, 3 and 4);

- Submission of 7 testpit and 10 primary samples of fill materials and field quality control samples to a National Association of Testing Authorities (NATA) accredited laboratories for variable analysis for the following suite of analytes:
    - Total Recoverable Hydrocarbons (TRHs);
    - Benzene, Toluene, Ethylbenzene and Xylene (BTEX);
    - Polycyclic Aromatic Hydrocarbons (PAHs);
    - Organochlorine Pesticides (OCPs);
    - Organophosphate Pesticides (OPPs);
    - Polychlorinated Biphenyls (PCBs);
    - Heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, mercury and zinc); and
    - Asbestos identification.
- Submission of 10 primary samples of natural soils and field quality control samples to NATA accredited laboratories for variable analysis for the following suite of analytes:
    - TRHs;
    - BTEX;
    - PAHs; and
    - Heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, mercury and zinc).

- Assessed the reliability of the field and laboratory procedures according to the requirements of NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd edition)*; and
- Prepared and submitted this DESI report including the following:
    - Desk study findings and findings of the subsurface investigation including, an outline of fieldwork undertaken, site conditions encountered, field observations, environmental testpit and bore logs.

- A conceptual site model, data quality objectives, investigation methodologies and analytical laboratory results.
- A general evaluation of the feasibility of the proposed development based on the potential environmental constraints identified.
- Recommendations of the management options and/or remediation actions required to address the contamination impacts identified (if any).

2. Site Description

2.1 Site Identification

The site is located in Heathcote, NSW, approximately 48 km southwest of the Sydney central business district (CBD). The site layout is presented in **Figure 2**. Details relating to the site are presented in **Table 1**.

Table 1 – Site Identification Details

Site Details	Description
Address	1-21 Dillwynnia Grove, Heathcote, NSW, 2233
Lot/DP	Lots 1 and 2 in DP 725184
Local Government Area	Sutherland Shire Council
Parish and County	Parish of Heathcote, County of Cumberland
Site Area	Approximately 17,500 m^2 (site survey 18/01/2017)
Registered Owner	Fuzortinn Pty Ltd
Zoning	Zone E4 Environmental Living
Current Land Use	Vacant
Proposed Land Use	Residential A and B (e.g. townhouses, apartment blocks, basement parking)
Grid Coordinates	316920 m E, 6226367 m N

2.2 Site Setting

The setting of the site including surrounding land use, topographical, geological and hydrogeological information for the locality is summarised in **Table 2**.

Table 2 – Site Setting Information

Category	Observation
Surrounding Land Use	▪ North: Boronia Grove, followed by low density residential; ▪ South: Dillwynnia Grove, followed by low density residential and the Royal National park; ▪ West: Low density residential; and ▪ East: Tecoma Street, followed by low density residential and the Royal National Park.
Topography	The ground surface at the site slopes from northeast to southwest. The ground surface varies in elevations from approximately 209 m (Australian Height Datum) AHD in the vicinity of the south-western boundary of the site to approximately 217 m AHD in the vicinity of the north-eastern boundary of the site, respectively.

Geology and Hydrogeology	Geological information obtained from the Sydney 1:100,000 Geological Series (Sheet 9130, Edition 1) indicates that the site is underlain by a subunit of the Hawkesbury Sandstone described as a claystone, siltstone and laminite. The remaining southern portion of the site is underlain by a sub-unit described as medium to coarse grained quartz sandstone, very minor shale and laminite lenses. Hydrogeological conditions at the site are likely to be defined by deeper aquifer systems. The deeper system is likely to be a semi-confined aquifer located within the rock fractures and defects within the Hawkesbury Sandstone bedrock. The deeper aquifer is thought to be located at a depth of >5 m bgs and would correspond to the regional system present at the site and local area.
Fill Materials	▪ Fill depth range: 0.0 m to 1.5 m along site western portion and 0.0 m to 0.5 m along site eastern portion; and ▪ Fill description: Silty/sandy/gravelly CLAY, low to medium plasticity, brown, greyish brown, orange mottled, fine to medium sand, gravels, traces of rootlets, foreign materials including bricks and crushed concrete.
Natural Soils/Rocks	▪ Clay depth range: 0.5 m to 7.4 m along site western portion and 0.5 m to 12 m along site eastern portion; ▪ Clay description: Silty CLAY/Gravelly Silty CLAY, stiff to hard, medium to high plasticity, brown, red-brown, pale grey to white, orange mottled, fine to coarse angular to sub-angular, rounded to sub-rounded gravel, trace of fine to medium sand, traces of carbonaceous deposits; ▪ Rock depth range: +7.4 m along site western portion and +12 m along site eastern portion; and ▪ Rock description: SHALE, pale grey to dark grey, moderately to slightly weathered, very low to low strength.
Acid Sulfate Soils	A review of the acid sulfate soils (ASS) risk maps (1997) for Port Hacking conducted by LG indicated that the site is located in an area designated as “No Known Occurrence”. Therefore, acid sulfate soils are not known or expected to occur in these areas. The ASS risk map defines that land management activities are not likely to be affected by acid sulfate soil materials.
Registered Groundwater Bores	A review of groundwater bore records available on the NSW Office of Water (NOW) online database was undertaken by GHD (GHD, 2017). The search was limited to registered bores located within a radius of approximately 500 m of the site. The search did not identify the presence of registered bores within a radius of approximately 500 m of the site.
Groundwater Depth	Perched water, if present, is likely to exist within fill and/or natural soils in discontinuous pockets and be encountered at depths near the fill/natural soil and soil/rock interfaces. Regional groundwater is expected to exist within the underlying formation depending on local fracturing and porosity.
Groundwater Flow Direction	Groundwater is inferred to be flowing in a southerly direction (based on topography).
Nearest Surface Water Feature	The nearest surface water body is Heathcote Brook, a tributary of Kangaroo Creek and the Hacking River, which flows west to east and is located approximately 500 m south of the site.

2.3 Site Condition

LG made the following observations during fieldworks conducted between 13 to 15 December 2017:

- The surface topography sloped down from northeast to southwest;
- The site comprised of a vacant block of land occupied with a main heritage listed building, trees and shrubs. Other structures across the site included sheds, stables and an outhouse;
- The north-eastern portion of the site was being used for the storage of construction materials including scaffolding equipment, concrete weights and timber;
- The south-eastern portion of the site was occupied by the Heathcote Hall (heritage listed building);
- The western portion of the site is covered with weeds, shrubs and trees;
- There was surface hardstand in the vicinity surrounding the Heathcote Hall. The remaining site surfaces comprised fill materials or natural soil and were generally overgrown with grasses and weeds;
- Two former ponds were located within the southern portion of the site. These had been emptied of water and sediment content;
- There was a stockpile of approximately 3 m^3 located in the north central portion of the site containing sand and crushed demolition waste. No fragments of bonded fibreboard material were observed;
- There was a stockpile of approximately 20 m^3 located in the eastern portion of the site containing sand and demolition waste including bricks, crushed concrete and tiles. No fragments of bonded fibreboard material were observed;
- There was a fill mound of approximately 5 m^3 located in the north-western corner of the site containing sand, clay and crushed demolition waste. Also, fragments of bonded fibreboard material (potentially containing asbestos);
- There was a 100 mm diameter fragment of bonded fibreboard material (potentially containing asbestos) located within the south western portion of the site, adjacent to the outhouse;

- No signs of oil spill or stains were noted on the floor surfaces across the site;
- Some rubbish or domestic waste was observed across the site;
- There were no active pipelines; and
- There were no above ground tanks (ASTs) or visible evidence of underground storage tanks (USTs) or systems which should cause air emissions such as laboratories, incinerators, surface impoundment and land treatment areas.

3. Previous Investigations

3.1 Summary of Previous Investigations

A summary of relevant previous investigation works that have been undertaken across the site is provided in **Table 3**.

Table 3 – Summary of Works Completed

Date	Report Objectives, Scope and Outcomes
GHD 2017 (27 October 2017) Phase 1 Contamination Assessment (Ref: 2316195)	The objectives of the report were to: ▪ Provide indicative information as to the risk and nature of contamination at the site based on past and current land uses. ▪ Provide comments on the potential contamination risks at the site and the need for further investigation (if required). The scope of the report included: ▪ A review of published geological, soil landscape and acid sulfate soils; ▪ A review of site operational history including the following database searches; – Review of the NSW Department of Primary Industries Water groundwater database for registered groundwater bores in the vicinity of the site; – Review of readily available historical aerial photographs to identify previous land uses that may indicate potential contamination; – Review of Section 149 Planning Certificates available for the site; – Review of the NSW EPA Register for notices issued under the Contaminated Land Management Act 1997 and the Protection of the Environment Operations Act 1997; and – Review of WorkCover Dangerous Goods records. ▪ A site walkover by an experienced environmental scientist to identify site features and activities that may indicate the potential for contamination of the site from present or past land uses; and ▪ Provision of a PESI report detailing the findings of the assessment. The outcomes of the report were: ▪ Site history information indicated that the site and the surrounding area had been used predominately for residential purposes. Other activities had occurred on site including horse stabling, storage of construction materials (e.g. bricks, concrete, timber, etc.) and vehicle maintenance. Fill materials appeared to have been placed along the western and eastern portions of the site and had an unknown origin and quality. ▪ Based upon the findings of this investigation the following four potential areas of environmental concern (AEC) were identified (refer **Figure 2**): - AEC 1: Potential weathering of hazardous building materials,

Date	Report Objectives, Scope and Outcomes
	demolition of former stable structures of unknown construction and storage of building materials; - AEC 2: Maintenance of vehicles and storage of waste oils; - AEC 3: Potential application of pesticides around buildings and former stables; and - AEC 4: Importing fill of unknown quality, quantity and origin. ▪ Potential Asbestos Containing Material (ACM) fragments were identified in a small area within the south-western corner of the garden area (AEC 1); and ▪ Further investigation is recommended prior to redevelopment of the site to assess these potential linkages.

4. Conceptual Site Model

A Conceptual Site Model (CSM) was developed in consideration of the background information, current site conditions and historical activities at the site. The CSM took into account the land use of low and high density residential buildings with 2 basement levels.

4.1 Potential Contamination Sources

Based on the review of the previous investigation conducted by GHD, the potential onsite contamination sources are considered to be as follows:

- AEC 1: Potential weathering of hazardous building materials, demolition of former stable structures of unknown construction and storage of building materials;
- AEC 2: Maintenance of vehicles and storage of waste oils;
- AEC 3: Potential application of pesticides around buildings and former stables; and
- AEC 4: Importation of fill of unknown quality, quantity and origin.

Buried hazardous materials include potential asbestos-containing materials (PACMs) such as bonded fibro fragments observed within the north-western and south-eastern portions of the site, respectively.

The AECs (areas of environmental concern) are shown on **Figure 2**.

4.2 Contaminants of Potential Concern

Based on the findings of available documents for previous investigations, the chemicals of potential concern (COPC) at the site are considered to be as follows:

- Soil - heavy metals (HMs), total recoverable hydrocarbons (TRHs), monocyclic aromatic hydrocarbon compounds benzene, toluene, ethyl-benzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine and organophosphorous pesticides (OCPs/OPPs), polychlorinated biphenyls (PCBs) and asbestos.

4.3 Exposure Pathway Evaluation

Exposure pathways that were considered relevant for this assessment are listed in **Table 4**.

Table 4 – Exposure Pathways

Contamination Source	Transport Mechanism	Exposure Media	Potential Receptors	Likelihood of Exposure
Impacted soils	Dermal contact during and post construction in accessible soil areas.	Ingestion and dermal contact, inhalation of asbestos fibres and volatile hydrocarbons (if present) during site redevelopment and/or future site use by occupants	Outdoor workers/ maintenance workers and future site occupants.	Unlikely if remedial action or onsite management to prevent exposure is undertaken.

4.4 Data Gaps

On the basis of the qualitative data available for the site, including site history review and preliminary site investigation (GHD, 2017), it was considered necessary to satisfactorily characterise potential contamination resulting from:

- Importation of fill materials to the site from of unknown source and origin;
- Potential spills and leaks from vehicular maintenance and storage of waste oils;
- Weathering of building surfaces (i.e. painted surfaces, metallic structures, cement-fibre building materials) on the site;
- Buried hazardous materials, including potential asbestos containing materials (PACMs) encasing utilities; and
- Possible use of organochlorine pesticides for termite and pest control.

5. Data Quality Objectives

In accordance with the DEC 2017 Guidelines for the NSW Site Auditor Scheme the process of developing Data Quality Objectives (DQO) was used by LG to determine the appropriate level of data quality needed for the specific data requirements of the project. The DQO process was applied to define the type, quantity and quality of data needed to support decisions for the assessment of the site, as outlined in **Table 5**.

Table 5 – Data Quality Objectives

Step	Objectives
State the Problem (Step 1)	For redevelopment purposes the site needs to be made suitable for ongoing residential land uses. The detailed investigations were therefore required to assess risks posed by contaminated soils to potential onsite and offsite receptors, in accordance with NSW EPA guidelines.
Identify the Decisions (Step 2)	The presence of asbestos contamination identified indicated that the site has been subject to potential contamination associated with past activities, including potential imported fill material, stockpiled soils and hardstand. To assess the environmental condition of the site for the proposed ongoing residential land uses, LG would make the required decisions based on the following questions: ▪ Is site soil and groundwater quality suitable for the intended land use? ▪ Are there any buried contaminant sources (or building materials) still present on the site? ▪ Do site soils or groundwater require further remediation or treatment and special management before the site can be used for the intended purposes, or to prevent offsite migration of contaminants?
Identify Inputs to the Decision (Step 3)	The primary inputs to the assessment of soil and groundwater were as follows: ▪ Results from previous investigation (GHD, 2017); ▪ Implementation of a sampling, analytical and quality plan; ▪ Observations made during the sampling program, which may influence the need for further assessment; ▪ Assessment of the suitability of the data obtained from sampling and analysis against data quality indicators (DQIs); ▪ Assessment of analytical results against relevant criteria. These would comprise elevant soil investigation levels (SILs), to determine the requirement for site remediation and validation.
Define the Study Boundaries (Step 4)	The spatial boundaries of the assessment were limited as follows: ▪ Lateral - the geographical boundary of the assessment was defined by the site boundary, as illustrated in **Figure 1**; ▪ Vertical - from the existing ground level to the proposed depth of the investigation (approximately 0.5 m into natural soil or

Step	Objectives
	refusal for testpits and 0.2 m to 1.5 m for soil bores); and ▪ Temporal - the findings of this assessment would provide and additional snapshots of the site contamination status and can be compared to the previous investigations to provide further evidence that the site can be made suitable for ongoing residential land use. The results of the investigation would apply to the site on the days of sampling, site activities postdating the investigation may invalidate the investigation results (or words to this effect).
Develop a Decision Rule (Step 5)	Laboratory test results would be accepted if: ▪ All contracted laboratories are accredited by NATA for the analyses undertaken; ▪ All laboratory analytical data is generally within pre-determined data acceptance criteria, in accordance with laboratory quality assurance and quality control (QA/QC) policies and DQOs; ▪ QA/QC results demonstrate acceptable reliability and representativeness of the data set; and ▪ Laboratory practical quantitation limits (PQL) are below the adopted acceptance/assessment criteria for the tested contaminants, wherever possible. If soil contamination was identified, further assessment may be required. Depending on the results of the assessment, a remediation action plan may be required to render the site suitable for the proposed ongoing residential land use.
Specify Limits of Decision Errors (Step 6)	Specific limits for this project are in accordance with the appropriate guidance made or endorsed by the NSW EPA, appropriate indicators of data quality and standard procedures for field sampling and handling. This step also examines the certainty of conclusive statements based on the available site data collected. This should include the following points to quantify tolerable limits: ▪ A decision can be made based on a probability that 95% of the data, which is collected using a systematic sampling pattern, will satisfy the given site criteria. This follows the guidance given in NSW EPA (1994) for site validation contingent upon the upper 95% confidence limit (95% UCL) on the average site concentrations for each respective contaminant being below the relevant criteria. Therefore, a limit on the decision error would be 5% that a conclusive statement may be incorrect. ▪ A decision can be made based on the probability that a contami nation hotspot of a certain circular diameter would be detected with 95% confidence using a selected density of systematic data points. The decision error would limited to a probability of 5% that a contamination hotspot may not be detected.
Optimise the Design for Obtaining Data (Step 7)	This step was intended to define the data collection design, which would generate data to efficiently and effectively satisfy the DQOs. Sampling procedures to be implemented to optimise data collection for achieving the DQOs included the following: ▪ Soil sampling from a systematic or triangular sampling grid.

Step	Objectives
	▪ Stratified sampling from selected depth intervals to characterise fill soils, separately to natural soils.

To ensure that the investigation data collected is of an acceptable quality the investigation data set was to be assessed against data quality indicators (DQI), which related to both field and laboratory-based procedures.

The pre-determined DQIs established for the project are discussed below in relation to the following PARCC parameters, and are shown in **Table 6**.

- Precision - measured the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques was assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- Accuracy - measured the bias in a measurement system. The accuracy of the laboratory data that was generated during this study was a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy was assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- Representativeness - expressed the degree which sample data accurately and precisely represented a characteristic of a population or an environmental condition. Representativeness was achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- Comparability - expressed the confidence with which one data set can be compared with another. This was achieved through maintaining a level of consistency in techniques used to collect samples; and ensuring analysing laboratories used consistent analysis techniques; and reporting methods.
- Completeness – was defined as the percentage of measurements made which were judged to be valid measurements. The completeness goal was set at there being sufficient valid data generated during the study.
- Sensitivity – expressed the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 6 – Summary of Data Quality Indicators

Data Quality Indicator	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD or agreement between asbestos presence/absence above the detection limit[1]
Blind duplicates (inter laboratory)	1 / 20 samples	
Laboratory Duplicates	1 / 20 samples	
Accuracy		
Surrogate Spikes	All organic analysis samples	70-130 % chemical analysis only
Laboratory Control Samples	1 per lab batch	70-130 % chemical analysis only
Matrix Spikes	1 per lab batch	70-130 % chemical analysis only
Representativeness		
Sampling appropriate for media and analytes	All samples	-
Samples extracted and analysed within holding times	All samples	Soil: organics - 14 days, Inorganics -6 months, asbestos N/A
Laboratory blanks	1 per laboratory batch	<LOR chemical analysis only
Trip Spikes	1 per sampling event with volatile analytes	70-130 % recovery for BTEX compounds
Storage blanks	1 per sampling event with volatile analytes	< LOR BTEX
Rinsate	1 per sampling event with chemical COPCs	< LOR chemical analysis only
Comparability		
Standard operating procedures for sample collection and handling	All samples	All samples[2]
Standard analytical methods used for all analytes	All samples	All samples[2]
Consistent field condition, sampling staff and laboratory analysis	All samples	All samples[2]
Limits of reporting appropriate and consistent	All samples	All samples[2]
Completeness		
Sample description, field quantification and COCs completed and appropriate	All samples	All samples[2]

Data Quality Indicator	Frequency	Data Quality Criteria
Satisfactory frequency and results for all QC samples	All QC samples	95 %
Data from critical samples considered valid	All samples	Critical samples valid[2]
Clear indication of how well the sampling programme complied with the SAQP	All samples	Critical samples valid[2]
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	LOR <= site assessment criteria

Notes:

1. If the RPD between duplicates was greater than the pre-determined data quality indicator, a judgment was made as to whether the excess was critical in relation to the validation of the data set or unacceptable sampling error was occurring in the field.

2. Qualitative assessment of compliance with standard procedures and appropriate sample collection methods was completed during the DQI compliance assessment.

6. Sampling and Analysis Methodology

6.1 Scope of Works

The overall scope of works for the contamination investigation was as follows:

- Preparation of a health safety and environment plan;
- Review of previous data and reports described in **Section 3.1**;
- Field investigations, involving:
  - Soil sampling from 7 testpit locations across the western portion of site (AEC 4) to a maximum depth within underlying natural soil layers, as shown in **Figure 2**;
  - Soil sampling from 20 soil bore locations across the site (AEC 1, 2, 3 and 4), as shown in **Figure 3**;
  - Logging of soil conditions and conduct field VOC screening using a portable photo-ionisation detector (PID);
  - Installation of 2 groundwater monitoring wells (BH08 and BH09, as shown in **Figure 3**;
  - Laboratory analysis of soil samples for the identified chemicals of concern including asbestos; and
  - Preparation of a site contamination report, with recommendations for remedial action, if warranted.

6.1.1 Sampling Rationale

The soil investigations were conducted by testpit excavations and soil bores using a combination of targeted and systematic sampling patterns to address the identified data gaps, as follows:

- Given that the site covers an area of approximately 17,500 m^2 (1.75 ha), a total of 27 soil sampling locations were proposed in accordance with the Minimum Sampling Points Required for Site Characterisation, published under the NSW EPA (1995) *Sampling Design Guidelines* located in a systematic grid pattern across the site;

- Excavation of 7 testpits systematically located within the western portion of the site (AEC 4), using an excavator to a minimum of 0.5 m into natural soils or refusal into bedrock;
- Collection of representative testpit samples of fill materials (i.e. 0.2 to 1.0 m bgs) and natural soils (i.e. 0.5 to 1.5 m bgs) at each of the testpit location and/or at changes in lithology or where visual and/or olfactory indicators of contamination were observed;
- Completion of detailed environmental logging of each testpit for evidence of contamination (e.g. by reference to staining, odour, presence of materials of anthropogenic materials), fill materials and soil properties;
- Drilling of 6 boreholes and collection of 2 soil samples (1 at surface and 1 at depth) from each borehole to assess for broad impacts from current and former site uses (AEC's 1, 3 and 4);
- Installation of 2 groundwater wells to a maximum depth of approximately 7 m bgs, to bedrock refusal;
- Collection of 1 surface sample from a depth no greater than 0.2 m using a shovel or trowel at 4 locations within 1 m of the external walls of Heathcote Hall and associated structures to assess for impacts as a result of the decay of lead based paint, asbestos and other potential hazardous building materials (AEC 1);
- Collection of 1 surface sample from a depth no greater than 0.2 m using a shovel or trowel at 10 locations across the remainder of the site to assess for broad impacts from current and former site activities (AEC 1, 2, 3 and 4); and
- The systematic (grid-based) sampling locations have been selected to target the AEC (areas of environmental concern) identified, with laboratory analyses on representative soil samples for potential contaminants including:
  - Broad coverage for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); total recoverable hydrocarbons (TRHs); monocyclic aromatic hydrocarbons - benzene, toluene, ethyl-benzene and xylenes (BTEX); polycyclic aromatic hydrocarbons (PAHs); organochlorine pesticides (OCPs); organophosphate pesticides (OPPs); polychlorinated biphenyls (PCBs).
  - Potential asbestos-containing materials (PACM) in impacted fill soils across the site.

6.1.2 Soil Investigation Methodology

- Subsurface investigations and soil sampling were conducted via use of an excavator, soil bore and drilling equipment. Excavator equipment was the preferred method to visually assess the fill extent within the western portion of the site, allowing collection of representative soil samples from the filling layer, the fill/clay interface and the natural (residual) clay, which underlies the fill layer.

- Subsurface conditions were logged by personnel qualified and experienced in dealing with contaminated sites.

- Testpit soil samples were generally collected at the following depths:

  - Two soil samples within the fill layer, one sample at 0.0-0.2 m, and deeper fill samples at 0.3–0.5 m bgl (subject to the thickness of the fill layer at each sampling location);

  - One soil sample at, or close to the fill-clay interface (estimated depth 0.50 – 0.1 m bgl);

  - One soil sample to characterise the residual clay layer; and

  - Additional soil samples to be collected where changes in lithology, evidence of contamination or elevated PID readings are noted.

- Sampling from soil bores was conducted using mechanical and hand drilling equipment at discrete locations across the site to collect samples at the surface and then at deeper intervals (depending on location).

- Soil samples were qualitatively screened in the field for VOC content using a portable photo-ionisation detector (PID). Sampling locations were measured with reference to existing site features and located with a hand-held GPS.

6.2 Laboratory Analysis

6.2.1 Soil Analyses

Based on the PID results and field observations, selected soil and samples were analysed in the laboratory for environmental purposes. Laboratory testing comprised analysis of 27 primary soil samples (assuming 1 sample per location where fill/suspected contamination identified).

It should be noted that multiple samples were collected from each sampling location. However, representative residual samples were only tested in selected locations to provide an indication of natural soil conditions.

Untested residual samples were held by the laboratory, and tested at a later stage if warranted (i.e. for vertical delineation purposes in the case that shallow fill is found to be contaminated).

Submission of 17 fill material samples to a National Association of Testing Authorities (NATA) accredited laboratory for variable analysis for the following suite of analytes:

- TRHs;
- BTEX;
- PAHs;
- OCPs;
- OPPs;
- PCBs;
- Heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, mercury and zinc); and
- Asbestos identification.

Submission of 10 fill material samples to a NATA accredited laboratory for variable analysis for the following suite of analytes:

- TRHs;
- BTEX;
- PAHs; and
- Heavy metals (arsenic, cadmium, copper, chromium, lead, nickel, mercury and zinc).

7. Assessment Criteria

7.1 Soil Assessment Guidelines

The soil investigations works were undertaken with consideration to aspects of the following guidelines, as relevant:

- NEPM (2013) Schedule B(1) *Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure 1999 – Amendment 2013*, National Environment Protection Council (NEPC), May 2013;
- NSW DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*;
- NSW DECC (2009) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*; and
- NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*;

Application of these guidelines to this DESI is briefly described below.

7.2 Soil Assessment Criteria

The guidelines to evaluate soil analytical results currently applied in NSW, as listed above, presents a range of Health-Based Soil Investigation Levels (HILs), Provisional Phytotoxicity-Based Investigation Levels (PILs), Ecological Investigation Levels (EILs), sensitive land use thresholds and expected background concentration ranges for urban redevelopment sites in NSW. Application of these guidelines are briefly described below.

HILs

The HILs described by NEPC (2013) guidelines are based on the *Australian exposure factor guidance* (enHealth 2012). HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use settings:

- HIL A - residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools;
- HIL B - residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats;
- HIL C - public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate; and
- HIL D - commercial/industrial such as shops, offices, factories and industrial sites.

SILs specifically for the lower volatility aliphatic and aromatic petroleum hydrocarbon components are also provided in NEPC (2013) for the various land use scenarios described above.

The NSW EPA endorsed contaminated site assessment process also stipulates that the impact of contaminants on ground and surface water, potential degradation of building structures and affects of chemical mixtures need to be considered.

PILs & EILs

The PILs (NSW DEC, 2006) and EILs (NEPC, 2013) have been devised for the protection of plant health, and are designed to be applied as single number criteria indicative of environmental effect. The PILs have been developed for application to sandy loam soils with a pH of 6 to 8. As such, their use has significant limitations since phytotoxicity depends on soil and species parameters in ways that are not fully understood and they are intended for use as a screening guide only. The NSW EPA decision process for assessing urban redevelopment sites stipulates that the PILs need to be considered on sites used for either residential purposes, or land uses including parks, recreational open space and secondary schools. PILs are not required to be adopted on land used for commercial/industrial purposes.

7.2.1 Adopted Soil Assessment Criteria

Given that the site will continue to be used for residential purposes, and in accordance with the decision process for assessment of urban redevelopment sites (EPA 2017), concentrations of contaminants in soils across the site were compared against the published investigation levels sourced from the following:

- NEPM (2013) Health-based Investigation Levels for Residential (HIL-A and B);
- NEPM (2013) Health-based Screening Levels (HSLs) for soil vapour intrusion in sandy soils for Residential (HSL-A and B); and
- NEPM (2013) Ecological Screening/Investigation Levels for Residential (ESL/EIL).

7.3 Aesthetic Criteria

Consistent with NSW EPA (2017), aesthetic issues were required to be considered for residential land use scenarios. Also, the 2013 NEPM 'Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater' advises that:

'There are no numeric Aesthetic Guidelines but the fundamental principle is that the soils should not be discoloured, malodorous (including when dug over or wet) nor of abnormal consistency. The natural state of the soil should be considered.'

Discoloured soils are not considered by the NSW EPA as a quality of the environment that needs to be protected on a residential site. Given these NEPM and NSW EPA requirements, the aesthetic criteria of relevance to the site in its present condition are considered to be:

- No malodorous materials exposed at ground surface;
- No malodorous gases emanating from the ground; and
- No floating product to remain on groundwater at the site.

7.4 Structural Guidelines

The 2013 NEPM *'Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater'* advises that:

'For some substances such as phenol and sulphates, their impact on structures (effect on PVC piping and cement, respectively) may override the health and environmental considerations. Guidelines for protection of structures in the built environment should be set for a small number of contaminants where there is a concern. A structural guideline of 2000 mg/kg is set for sulphate in soil'

The available information indicates there should be a low risk of significant structural issues for the site as a result of possible contaminants in the ground which could cause corrosion, erosion or destruction of structures.

8. Quality Assurance and Quality Control (QA/QC)

8.1 Data Validation

The QA/QC program implemented for this DESI was generated as the outcome of the seven-step DQO process, as described in **Section 5**.

The achievement of the project DQOs was demonstrated by reference to the Data Quality Indicators (DQIs), precision, accuracy, representativeness, completeness and comparability. Details of the QA/QC data validation are presented in **Appendix B**.

8.2 Data Useability

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported field and analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of this assessment. It is concluded that overall the quality of the field and analytical data produced is reliable for the purpose of this soil validation report.

9. Results

The results of the fieldworks and laboratory analysis undertaken for this DESI are detailed in **Sections 9.1** to **9.2** below.

9.1 Field Results

9.1.1 Sub-Surface Observation and Condition

The sub-surface conditions encountered at the targeted areas investigated generally comprised of fill materials with sand, gravel and clay underlain by natural clay. A summary of the sub-surface conditions encountered at the site is provided in **Table 7**.

Table 7 – Generalised Stratigraphy

Sub-surface Conditions		Depth (Top of Unit m bgs)
Geological Unit	Description	
Fill	**Fill**; Sand, gravel and clay with some traces of demolition fragments, light grey, poorly graded, loose, dry.	0.0 – 1.0 m
Clay	**Clay**; orange-yellow-brown, non-plastic to low plasticity, firm to stiff, hard, moist.	0.5 – 1.5 m

9.1.2 VOC Screening

Samples of fill materials and natural soils were screened for the presence of VOCs in the field using a calibrated photoionisation detector (PID).

Concentrations of VOCs ranged from 0 ppm to 26.3 ppm within fill materials with sample TP3 at 0.2-0.3 m bgs measuring the highest reading. PID readings in natural soils were all 0.0 ppm. These results are consistent with the analytical results in which concentrations of volatile hydrocarbons were generally less than the laboratory EQLs. It is noted that the highest concentrations of petroleum hydrocarbons (i.e. TRH compounds) were reported at TP3 at 0.2-0.3 m bgs.

9.2 Analytical Results

9.2.1 Soil Analytical Results

A total of 7 testpit samples and 20 soil bore samples (including 2 duplicates and 1 triplicate sample) collected on 13, 14 and 15 December 2017 from across the site were submitted for laboratory analysis. Testpit and soil bore sampling locations are shown in **Figure 3** and analytical results are summarised in **Table A** attached.

In addition, a total of 2 bonded fibro cement fragments (PACM1 and PACM2) collected from surfaces across the site were analysed for asbestos identification.

Chain of Custody (COC) documentation and certified laboratory reports are included in **Appendix C**.

Laboratory results indicated that:

- Concentrations of petroleum hydrocarbons (as TRH and BTEX compounds) were either below the laboratory Estimated Quantitation Limit (EQL), EILs or HILs criteria in all samples collected, with the exception of the following:
  - Concentrations of TRH C16-C34 less BTEX (F3) were above the EIL in sample TP3/0.2-0.3.
- Concentrations of total PAHs, benzo(a)pyrene, OCPs, OPPs, PCBs and metals (arsenic, cadmium, copper, chromium, lead, nickel, mercury and zinc) were either below the laboratory EQL, EILs or HILs criteria in all samples collected, with the exception of the following:
  - Concentrations of chromium were above the HIL A in samples S9 and SH3.
  - Concentrations of lead were above the HIL A in samples S10 and SH3.
- Asbestos fibres (amosite and chrysotile) were detected above the HIL A in sample TP5/0.2-0.3, collected within the fill material at Testpit 5; and
- Asbestos containing materials (ACMs) were identified in the following bonded cement fragments:
  - Amosite and chrysotile asbestos was detected in sample PACM1, collected within the fill material at Testpit.
  - Amosite, chrysotile and crocidolite asbestos was detected in sample PACM2, collected from surface at south eastern portion of the site.
  - The above samples can be referred as ACMs.

10. Conclusions and Recommendations

10.1 Conclusions

Based on the findings of this DESI the following conclusions are provided:

- The surface fill materials comprised sand, gravel and clay with traces of demolition fragments, at the locations investigated. This fill was underlain by natural clay;
- The soils at the locations sampled and analysed did not contain concentrations of TRHs, BTEX, PAHs, OCPs, OPPs, PCBs and heavy metals that were greater than the Residential A and B land use criteria, at the time tested, with the following exceptions;
  - Concentrations of TRH C16-C34 less BTEX (F3) were above the EIL in sample TP3/0.2-0.3. However, further statistical assessment indicated that the isolated occurrence of elevated TRH impact at TP3/0.2-0.3 is not considered significant at the site (refer **Table C**).
  - Concentrations of chromium were above the HIL A in samples S9 and SH3 and lead concentrations were above the HIL A in samples S10 and SH3. However, it is considered that residential HILs at the site have limited application due to significant sealing expected on site surfaces and landscaping areas. Also, consideration for remediation drivers would not be required where there is no associated human health risk.
  - It is further noted that the vast majority of these soils will be removed during the proposed basement excavation and risks to site occupants and vegetation will be further reduced. Therefore, LG considers that the TRH, chromium and lead impact identified will not adversely affect the suitability of the site for the proposed use.
- Asbestos fibres (amosite and chrysotile) were detected above the HIL A in sample TP5/0.2-0.3, collected within the fill material at Testpit 5;
- Bonded cement fragments collected from surfaces across the site for laboratory verification analysis confirmed the presence of asbestos containing materials in samples PACM1 and PACM2, which can be referred as ACMs; and

- The assessment results indicate that the site subject to this DESI can be made suitable for Residential A and B land use, consistent with a Zone E4 Environmental Living zoning, provided that soils contaminated with asbestos are removed and disposed off-site appropriately.

10.2 Recommendations

Based on the conclusions above the following recommendations are provided:

- Remediation and validation works be undertaken, in order to safely remove Asbestos Hotspot TP5/0.2-0.3 and bonded ACMs identified to demonstrate that the remaining excavations and excavated soils meet NSW EPA requirements for Residential A and B land use.

These conclusions and recommendations are made within the limitations of the work, which has been undertaken. A statement of these limitations is included after **Section 11** of this report.

11. References

ASTM Standard Practice D2488-90 *Description and Identification of Soils (Visual-Manual Procedure)*. American Society for Testing and Materials.

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Limitation Statement

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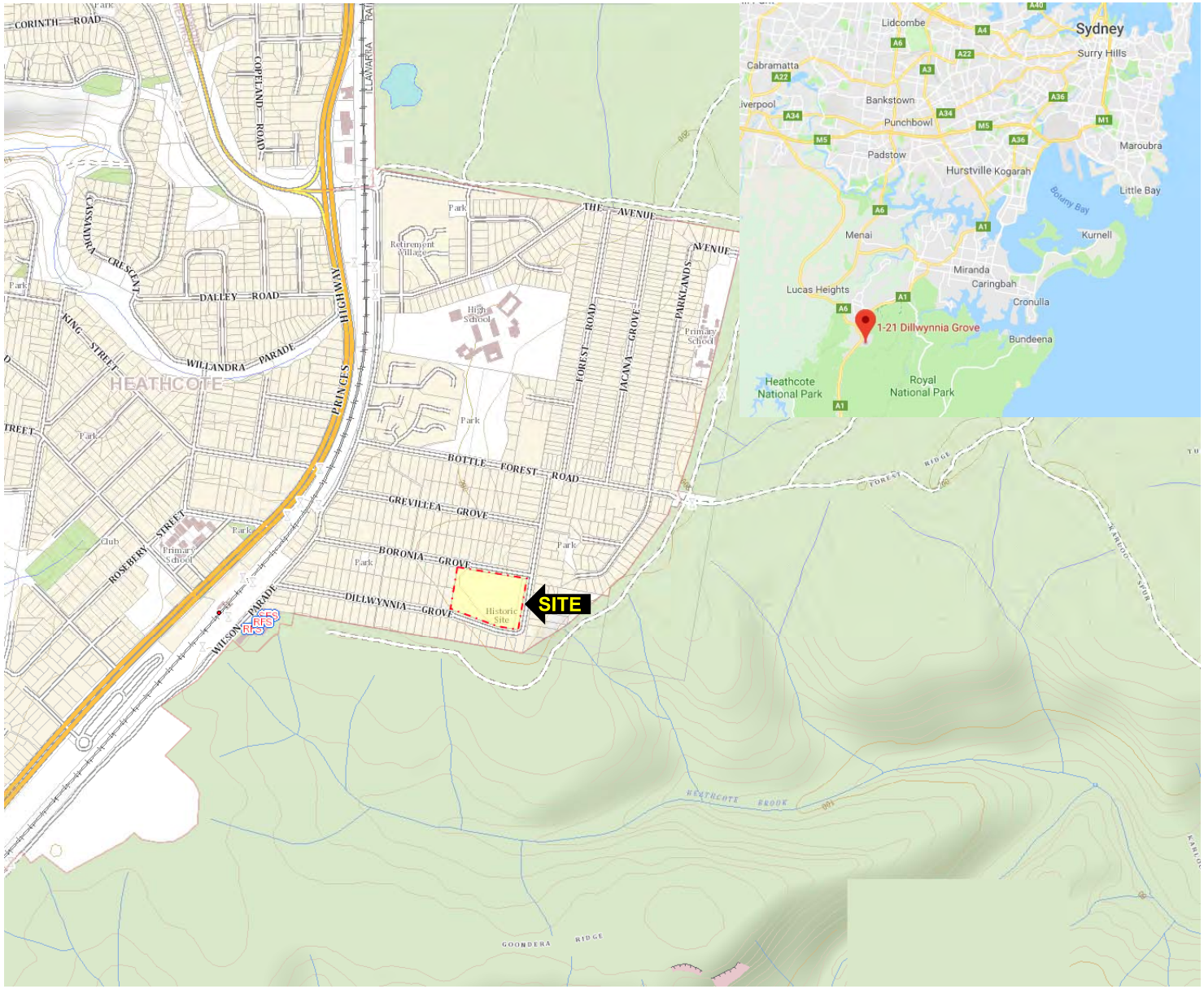
Figures



SCALE: DRAWN TO SCALE AS SHOWN

Not To Scale

NORTH

LEGEND:

Site Boundary

Images courtesy of Google Maps & SIX Maps

LG CONSULT

REV:	A
DATE:	18/12/2017
DRAWN:	GP
APPROVED:	GP
STATUS:	Final
DWG NO:	

CLIENT: **Fuzortinn**

PROJECT: **1-21 Dillwynnia Grove, Heathcote, NSW**

PROJECT NUMBER: LG17100.01

TITLE:

Site Location Plan

FIGURE:

1

A4

SCALE: DRAWN TO SCALE AS SHOWN

Not To Scale

NORTH

LEGEND:

Site Features

- Site boundary
- Fragments of Potential Asbestos Containing Material
- Stockpile area

Areas of Environmental Concern

- AEC 1 – Weathering, demolition and stockpiling
- AEC 2 – Maintenance of vehicles and storage of waste oils
- AEC 3 – Historical application of pesticides
- AEC 4 – Potential imported fill of unknown origin

Image courtesy of GHD

LG CONSULT

REV:	A
DATE:	18/12/2017
DRAWN:	GP
APPROVED:	GP
STATUS:	Final
DWG NO:	

CLIENT: **Fuzortinn**

PROJECT: **1-21 Dillwynnia Grove, Heathcote, NSW**

PROJECT NUMBER: LG17100.01

TITLE: **Site Layout**

FIGURE: **2** A4

SCALE: DRAWN TO SCALE AS SHOWN

Not To Scale

NORTH

LEGEND:

Site Features

- Site boundary
- Fragments of Potential Asbestos Containing Material
- Stockpile area

Areas of Environmental Concern

- AEC 1 – Weathering, demolition and stockpiling
- AEC 2 – Maintenance of vehicles and storage of waste oils
- AEC 3 – Historical application of pesticides
- AEC 4 – Potential imported fill of unknown origin

Testpit Location
TP1

Soil Bore Sampling Location
S1

Potentially Asbestos Containing Material (PACM)
PACM

Image courtesy of GHD

LG CONSULT

REV:	A
DATE:	18/12/2017
DRAWN:	GP
APPROVED:	GP
STATUS:	Final
DWG NO:	

CLIENT: **Fuzortinn**

PROJECT: **1-21 Dillwynnia Grove, Heathcote, NSW**

PROJECT NUMBER: LG17100.01

TITLE: **Sampling Locations**

FIGURE: **3** A4

Tables

Table A - Soil Analytical Results

Laboratory ID							SE173782.001	SE173782.002	SE173782.003	SE173782.004	SE173782.005	SE173782.006
Sample ID							TP1/0.5-1.0	TP2/0.3-1.0	TP3/0.2-0.3	TP4/0.2-0.3	TP5/0.2-0.3	TP6/0.2-0.3
Depth (m)							0.5-1.0	0.3 - 1.0	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3
Soil Type							Fill: Clay & Sand	Fill: Clay & Sand	Fill: Clay & Sand	Fill: Ash & Sand	Fill: Sand & Clay	Fill: Clay
Date Sampled							13/12/2017	13/12/2017	13/12/2017	13/12/2017	13/12/2017	13/12/2017
			NEPM 2013									
Compounds	Unit	EQL	Residential HIL A[1]	Residential HIL B[3]	Recreational HIL C[3]	Urban Residential and Public Open Space - EIL [4]						
TRHs												
TRH C6-C9	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TPH C6-C10 less BTEX (F1)	mg/kg	25	45 [2]	45 [2]	-	180	<25	<25	<25	<25	<25	<25
TRH C10-C14	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	-	-	-	-	<45	<45	290	<45	<45	<45
TRH C29-C36	mg/kg	45	-	-	-	-	<45	<45	280	63	<45	<45
TRH C37-C40	mg/kg	100	-	-	-	-	<100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	-	-	-	-	<25	<25	68	<25	<25	<25
TRH >C10-C16 less Naphthalene (F2)	mg/kg	25	110 [2]	110 [2]	-	120	<25	<25	68	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	300	<90	<90	450	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	2800	<120	<120	<120	<120	<120	<120
TRH >C10-C36	mg/kg	110	-	-	-	-	<110	<110	570	<110	<110	<110
TRH >C10-C40	mg/kg	210	-	-	-	-	<210	<210	520	<210	<210	<210
BTEX												
Benzene	mg/kg	0.1	0.5 [2]	0.5 [2]	-	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	55 [2]	55 [2]	-	70	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	160 [2]	160 [2]	-	85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	40 [2]	40 [2]	-	105	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
PAHs												
Naphthalene	mg/kg	0.1	3 [2]	3 [2]	-	170	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	-	-	-	-	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	-	-	-	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	3	4	3	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	3	4	3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	3	4	3	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PAHs (Sum of total)	mg/kg	1	300	400	300	-	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
OCPs												
Hexachlorobenzene (HCB)	mg/kg	0.1	10	15	10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	6	10	10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	6	10	10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	270	400	340	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Beta Endosulfan	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	mg/kg	0.1	50	90	70	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDE	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDE	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.1	10	20	20	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	300	500	400	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	10	20	20	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
OPPs												
Dichlorvos	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	160	340	250	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PCBs												
Arochlor 1016	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	1	1	1	-	<1	<1	<1	<1	<1	<1
Metals												
Arsenic	mg/kg	3	100	500	300	100	9	7	4	4	5	6
Cadmium	mg/kg	0.3	20	150	90	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	mg/kg	0.3	100	500	300	570	42	20	13	15	4.1	46
Copper	mg/kg	0.5	6,000	30000	17000	280	6	9.3	7.2	9.8	18	3.3
Lead	mg/kg	1	300	1200	600	1100	21	31	19	12	40	14
Mercury	mg/kg	0.01	40	120	80	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	mg/kg	0.5	400	1200	1200	350	3.5	5.1	2.5	8	2.5	2.1
Zinc	mg/kg	0.5	7,400	60000	30000	880	25	150	80	170	44	19
Asbestos												
Asbestos Detected - Fibre Identification in soil	No unit	0	No Detected	No Detected	No Detected	-	No	No	No	No	Yes	No
Estimated Fibres - Fibre Identification in soil	%w/w	0.01	0.01	0.04	0.02	-	<0.01	<0.01	<0.01	<0.01	>0.01	<0.01
Asbestos Detected - Fibre ID in bulk materials (cement fragment)	No unit	0	No Detected	No Detected	No Detected	-	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Table 1A(1), HIL Column 1 - Health Based Investigation Levels for Residential with Garden/Accessible Soil - NEHF A (NEPC, 2013)
2 - Table 1A(3), HSL A & HSL B Column 1 (Sand 0 m to <1 m) - Soil HSLs for Vapour Intrusion for Low – High Density Residential - NEHF B (NEPC, 2013)
3 - Table 1A(1), HIL Column 2 - Health Based Investigation Levels for Residential with minimal opportunities for soil access - NEHF B (NEPC, 2013)
4 - Table 1A(1), HIL Column 3 - Health Based Investigation Levels for (Recreational) Public Open Space such as parks, playgrounds, playing fields - NEHF C (NEPC, 2013)
5 - Tables 1B(1), 1B(2), 1B(3), 1B(4), 1B(5) and 1B(6), EILs and ESLs - Urban Residential/Public Open Space (NEPC, 2013)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
40

Table A - Soil Analytical Results

Laboratory ID							SE173782.007	SE173782.008	SE173782.027	ES1732021-001	SE173782.009	SE173782.010
Sample ID							TP7/0.2-0.3	S1	QC1A	QC1B	S2	S3
Depth (m)							0.2 - 0.3	0.0 - 0.2	Duplicate of S1	Triplicate of S1	0.0 - 0.2	0.0 - 0.2
Soil Type							Fill: Clay & Sand	Fill: Sand & Gravel			Fill: Sand & Gravel	Fill: Sand
Date Sampled							13/12/2017	14/12/2017	14/12/2017	14/12/2017	14/12/2017	14/12/2017
			NEPM 2013									
Compounds	Unit	EQL	Residential HIL A[1]	Residential HIL B[3]	Recreational HIL C[3]	Urban Residential and Public Open Space - EIL [4]						
TRHs												
TRH C6-C9	mg/kg	20	-	-	-	-	<20	<20	<20	<10	<20	<20
TRH C6-C10	mg/kg	25	-	-	-	-	<25	<25	<25	<10	<25	<25
TPH C6-C10 less BTEX (F1)	mg/kg	25	45 [2]	45 [2]	-	180	<25	<25	<25	<10	<25	<25
TRH C10-C14	mg/kg	20	-	-	-	-	<20	<20	<20	<50	<20	<20
TRH C15-C28	mg/kg	45	-	-	-	-	<45	<45	<45	<100	<45	<45
TRH C29-C36	mg/kg	45	-	-	-	-	<45	<45	<45	<100	<45	<45
TRH C37-C40	mg/kg	100	-	-	-	-	<100	<100	<100	NA	<100	<100
TRH >C10-C16	mg/kg	25	-	-	-	-	<25	<25	<25	<50	<25	<25
TRH >C10-C16 less Naphthalene (F2)	mg/kg	25	110 [2]	110 [2]	-	120	<25	<25	<25	<50	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	300	<90	<90	<90	<100	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	2800	<120	<120	<120	<100	<120	<120
TRH >C10-C36	mg/kg	110	-	-	-	-	<110	<110	<110	<50	<110	<110
TRH >C10-C40	mg/kg	210	-	-	-	-	<210	<210	<210	<50	<210	<210
BTEX												
Benzene	mg/kg	0.1	0.5 [2]	0.5 [2]	-	50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	55 [2]	55 [2]	-	70	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Toluene	mg/kg	0.1	160 [2]	160 [2]	-	85	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2
Xylene (o)	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Xylene Total	mg/kg	0.3	40 [2]	40 [2]	-	105	<0.3	<0.3	<0.3	<0.5	<0.3	<0.3
PAHs												
Naphthalene	mg/kg	0.1	3 [2]	3 [2]	-	170	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Acenaphthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Fluorene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Phenanthrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Chrysene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	-	-	-	0.7	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	3	4	3	-	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	3	4	3	-	<0.3	<0.3	<0.3	0.6	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	3	4	3	-	<0.2	<0.2	<0.2	1.2	<0.2	<0.2
PAHs (Sum of total)	mg/kg	1	300	400	300	-	<0.8	<0.8	<0.8	<0.5	<0.8	<0.8
OCPs												
Hexachlorobenzene (HCB)	mg/kg	0.1	10	15	10	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Lindane	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Heptachlor	mg/kg	0.1	6	10	10	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Aldrin	mg/kg	0.1	6	10	10	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Dieldrin	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Alpha BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Beta BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Delta BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Heptachlor epoxide	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Alpha Endosulfan	mg/kg	0.2	270	400	340	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
Beta Endosulfan	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Endosulfan sulphate	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Gamma Chlordane	mg/kg	0.1	50	90	70	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Alpha Chlordane	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
trans-Nonachlor	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
p,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	<0.2	<0.2	<0.05	NA	<0.2
p,p'-DDE	mg/kg	0.1					<0.1	<0.1	<0.1	<0.05	NA	<0.1
p,p'-DDD	mg/kg	0.1					<0.1	<0.1	<0.1	<0.05	NA	<0.1
o,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	<0.2	<0.2	<0.05	NA	<0.2
o,p'-DDE	mg/kg	0.1					<0.1	<0.1	<0.1	<0.05	NA	<0.1
o,p'-DDD	mg/kg	0.1					<0.1	<0.1	<0.1	<0.05	NA	<0.1
Endrin	mg/kg	0.1	10	20	20	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Endrin Aldehyde	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Methoxychlor	mg/kg	0.1	300	500	400	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Endrin Ketone	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Isodrin	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
Mirex	mg/kg	0.1	10	20	20	-	<0.1	<0.1	<0.1	<0.05	NA	<0.1
OPPs												
Dichlorvos	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.05	NA	<0.5
Dimethoate	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.05	NA	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.05	NA	<0.5
Fenitrothion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
Malathion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	160	340	250	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Bromophos Ethyl	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
Methidathion	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.05	NA	<0.5
Ethion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.05	NA	<0.2
PCBs												
Arochlor 1016	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1221	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1232	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1242	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1248	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1254	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1260	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1262	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Arochlor 1268	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	NA	<0.2
Total PCBs (Arochlors)	mg/kg	1	1	1	1	-	<1	<1	<1	<1	NA	<1
Metals												
Arsenic	mg/kg	3	100	500	300	100	5	20	18	16	5	6
Cadmium	mg/kg	0.3	20	150	90	-	<0.3	0.8	0.7	<0.1	<0.3	<0.3
Chromium	mg/kg	0.3	100	500	300	570	15	16	15	16	18	26
Copper	mg/kg	0.5	6,000	30000	17000	280	2.3	28	28	27	3.5	4.9
Lead	mg/kg	1	300	1200	600	1100	9	73	63	64	9	10
Mercury	mg/kg	0.01	40	120	80	-	<0.05	0.1	0.09	0.1	<0.05	<0.05
Nickel	mg/kg	0.5	400	1200	1200	350	1.7	8.3	8.4	9	2.5	1.5
Zinc	mg/kg	0.5	7,400	60000	30000	880	16	150	180	152	28	30
Asbestos												
Asbestos Detected - Fibre Identification in soil	No unit	0	No Detected	No Detected	No Detected	-	No	No	NA	NA	NA	No
Estimated Fibres - Fibre Identification in soil	%w/w	0.01	0.01	0.04	0.02	-	<0.01	<0.01	NA	NA	NA	<0.01
Asbestos Detected - Fibre ID in bulk materials (cement fragment)	No unit	0	No Detected	No Detected	No Detected	-	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Table 1A(1), HIL Column 1 - Health Based Investigation Levels for Residential with Garden/Accessible Soil - NEHF A (NEPC, 2013)
2 - Table 1A(3), HSL A & HSL B Column 1 (Sand 0 m to <1 m) - Soil HSLs for Vapour Intrusion for Low – High Density Residential - NEHF B (NEPC, 2013)
3 - Table 1A(1), HIL Column 2 - Health Based Investigation Levels for Residential with minimal opportunities for soil access - NEHF B (NEPC, 2013)
4 - Table 1A(1), HIL Column 3 - Health Based Investigation Levels for (Recreational) Public Open Space such as parks, playgrounds, playing fields - NEHF C (NEPC, 2013)
5 - Tables 1B(1), 1B(2), 1B(3), 1B(4), 1B(5) and 1B(6), EILs and ESLs - Urban Residential/Public Open Space (NEPC, 2013)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
40

Table A - Soil Analytical Results

Laboratory ID							SE173782.011	SE173782.012	SE173782.013	SE173782.014	SE173782.015	SE173782.028
Sample ID							S4	S5	S6	S7	S8	QC2A
Depth (m)							0.0 - 0.2	0.0 - 0.2	0.0 - 0.2	0.0 - 0.2	0.0 - 0.2	Duplicate of S8
Soil Type							Fill: Clay	Fill: Sand & Gravel	Fill: Clay & Sand	Fill: Clay	Fill: Sand & Gravel	
Date Sampled							14/12/2017	14/12/2017	14/12/2017	14/12/2017	14/12/2017	14/12/2017
Compounds	Unit	EQL	NEPM 2013 Residential HIL A[1]	NEPM 2013 Residential HIL B[3]	NEPM 2013 Recreational HIL C[3]	NEPM 2013 Urban Residential and Public Open Space - EIL [4]						
TRHs												
TRH C6-C9	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TPH C6-C10 less BTEX (F1)	mg/kg	25	45 [2]	45 [2]	-	180	<25	<25	<25	<25	<25	<25
TRH C10-C14	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	-	-	-	-	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	-	-	-	-	<45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	-	-	-	-	<100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TRH >C10-C16 less Naphthalene (F2)	mg/kg	25	110 [2]	110 [2]	-	120	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	300	<90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	2800	<120	<120	<120	<120	<120	<120
TRH >C10-C36	mg/kg	110	-	-	-	-	<110	<110	<110	<110	<110	<110
TRH >C10-C40	mg/kg	210	-	-	-	-	<210	<210	<210	<210	<210	<210
BTEX												
Benzene	mg/kg	0.1	0.5 [2]	0.5 [2]	-	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	55 [2]	55 [2]	-	70	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	160 [2]	160 [2]	-	85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	40 [2]	40 [2]	-	105	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
PAHs												
Naphthalene	mg/kg	0.1	3 [2]	3 [2]	-	170	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	0.1	<0.1	0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	-	-	-	0.7	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	3	4	3	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	3	4	3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	3	4	3	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PAHs (Sum of total)	mg/kg	1	300	400	300	-	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
OCPs												
Hexachlorobenzene (HCB)	mg/kg	0.1	10	15	10	-	NA	<0.1	NA	<0.1	<0.1	NA
Lindane	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Heptachlor	mg/kg	0.1	6	10	10	-	NA	<0.1	NA	<0.1	<0.1	NA
Aldrin	mg/kg	0.1	6	10	10	-	NA	<0.1	NA	<0.1	<0.1	NA
Dieldrin	mg/kg	0.1				-	NA	<0.1	NA	<0.1	<0.1	NA
Alpha BHC	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Beta BHC	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Delta BHC	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Heptachlor epoxide	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Alpha Endosulfan	mg/kg	0.2	270	400	340	-	NA	<0.2	NA	<0.2	<0.2	NA
Beta Endosulfan	mg/kg	0.1				-	NA	<0.1	NA	<0.1	<0.1	NA
Endosulfan sulphate	mg/kg	0.1				-	NA	<0.1	NA	<0.1	<0.1	NA
Gamma Chlordane	mg/kg	0.1	50	90	70	-	NA	<0.1	NA	<0.1	<0.1	NA
Alpha Chlordane	mg/kg	0.1				-	NA	<0.1	NA	<0.1	<0.1	NA
trans-Nonachlor	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
p,p'-DDT	mg/kg	0.2	240	600	400	180	NA	<0.2	NA	<0.2	<0.2	NA
p,p'-DDE	mg/kg	0.1					NA	<0.1	NA	<0.1	<0.1	NA
p,p'-DDD	mg/kg	0.1					NA	<0.1	NA	<0.1	<0.1	NA
o,p'-DDT	mg/kg	0.2	240	600	400	180	NA	<0.2	NA	<0.2	<0.2	NA
o,p'-DDE	mg/kg	0.1					NA	<0.1	NA	<0.1	<0.1	NA
o,p'-DDD	mg/kg	0.1					NA	<0.1	NA	<0.1	<0.1	NA
Endrin	mg/kg	0.1	10	20	20	-	NA	<0.1	NA	<0.1	<0.1	NA
Endrin Aldehyde	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Methoxychlor	mg/kg	0.1	300	500	400	-	NA	<0.1	NA	<0.1	<0.1	NA
Endrin Ketone	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Isodrin	mg/kg	0.1	-	-	-	-	NA	<0.1	NA	<0.1	<0.1	NA
Mirex	mg/kg	0.1	10	20	20	-	NA	<0.1	NA	<0.1	<0.1	NA
OPPs												
Dichlorvos	mg/kg	0.5	-	-	-	-	NA	<0.5	NA	<0.5	<0.5	NA
Dimethoate	mg/kg	0.5	-	-	-	-	NA	<0.5	NA	<0.5	<0.5	NA
Diazinon (Dimpylate)	mg/kg	0.5	-	-	-	-	NA	<0.5	NA	<0.5	<0.5	NA
Fenitrothion	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Malathion	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	160	340	250	-	NA	<0.2	NA	<0.2	<0.2	NA
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Bromophos Ethyl	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Methidathion	mg/kg	0.5	-	-	-	-	NA	<0.5	NA	<0.5	<0.5	NA
Ethion	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
PCBs												
Arochlor 1016	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1221	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1232	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1242	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1248	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1254	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1260	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1262	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Arochlor 1268	mg/kg	0.2	-	-	-	-	NA	<0.2	NA	<0.2	<0.2	NA
Total PCBs (Arochlors)	mg/kg	1	1	1	1	-	NA	<1	NA	<1	<1	NA
Metals												
Arsenic	mg/kg	3	100	500	300	100	5	7	<3	3	5	6
Cadmium	mg/kg	0.3	20	150	90	-	<0.3	0.4	0.5	<0.3	<0.3	<0.3
Chromium	mg/kg	0.3	100	500	300	570	9.2	58	11	20	87	37
Copper	mg/kg	0.5	6,000	30000	17000	280	6.9	13	69	14	6.7	6.9
Lead	mg/kg	1	300	1200	600	1100	12	69	7	14	69	66
Mercury	mg/kg	0.01	40	120	80	-	<0.05	0.07	<0.05	<0.05	0.09	0.08
Nickel	mg/kg	0.5	400	1200	1200	350	2.9	2.8	220	13	3.8	3.8
Zinc	mg/kg	0.5	7,400	60000	30000	880	27	340	95	29	77	120
Asbestos												
Asbestos Detected - Fibre Identification in soil	No unit	0	No Detected	No Detected	No Detected	-	NA	No	NA	No	No	NA
Estimated Fibres - Fibre Identification in soil	%w/w	0.01	0.01	0.04	0.02	-	NA	<0.01	NA	<0.01	<0.01	NA
Asbestos Detected - Fibre ID in bulk materials (cement fragment)	No unit	0	No Detected	No Detected	No Detected	-	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Table 1A(1), HIL Column 1 - Health Based Investigation Levels for Residential with Garden/Accessible Soil - NEHF A (NEPC, 2013)
2 - Table 1A(3), HSL A & HSL B Column 1 (Sand 0 m to <1 m) - Soil HSLs for Vapour Intrusion for Low – High Density Residential - NEHF B (NEPC, 2013)
3 - Table 1A(1), HIL Column 2 - Health Based Investigation Levels for Residential with minimal opportunities for soil access - NEHF B (NEPC, 2013)
4 - Table 1A(1), HIL Column 3 - Health Based Investigation Levels for (Recreational) Public Open Space such as parks, playgrounds, playing fields - NEHF C (NEPC, 2013)
5 - Tables 1B(1), 1B(2), 1B(3), 1B(4), 1B(5) and 1B(6), EILs and ESLs - Urban Residential/Public Open Space (NEPC, 2013)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
40

Table A - Soil Analytical Results

Laboratory ID							SE173782.016	SE173782.017	SE173782.018	SE173782.019	SE173782.020	SE173782.021
Sample ID							S9	S10	SH1	SH2	SH3	SH4
Depth (m)							0.0 - 0.2	0.0 - 0.2	0.0 - 0.2	0.0 - 0.2	0.0 - 0.2	0.0 - 0.2
Soil Type							Fill: Sand & Gravel	Fill: Clay & Sand	Fill: Sand & Gravel	Fill: Sand & Gravel	Fill: Clay & Sand	Fill: Clay & Sand
Date Sampled							14/12/2017	14/12/2017	14/12/2017	14/12/2017	14/12/2017	14/12/2017
			NEPM 2013									
Compounds	Unit	EQL	Residential HIL A[1]	Residential HIL B[3]	Recreational HIL C[3]	Urban Residential and Public Open Space - EIL [4]						
TRHs												
TRH C6-C9	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TPH C6-C10 less BTEX (F1)	mg/kg	25	45 [2]	45 [2]	-	180	<25	<25	<25	<25	<25	<25
TRH C10-C14	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	-	-	-	-	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	-	-	-	-	<45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	-	-	-	-	<100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TRH >C10-C16 less Naphthalene (F2)	mg/kg	25	110 [2]	110 [2]	-	120	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	300	<90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	2800	<120	<120	<120	<120	<120	<120
TRH >C10-C36	mg/kg	110	-	-	-	-	<110	<110	<110	<110	<110	<110
TRH >C10-C40	mg/kg	210	-	-	-	-	<210	<210	<210	<210	<210	<210
BTEX												
Benzene	mg/kg	0.1	0.5 [2]	0.5 [2]	-	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	55 [2]	55 [2]	-	70	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	160 [2]	160 [2]	-	85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	40 [2]	40 [2]	-	105	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
PAHs												
Naphthalene	mg/kg	0.1	3 [2]	3 [2]	-	170	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	0.1	<0.1	0.2	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	-	-	-	0.7	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	3	4	3	-	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	3	4	3	-	<0.3	<0.3	<0.3	0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	3	4	3	-	<0.2	<0.2	<0.2	0.3	<0.2	<0.2
PAHs (Sum of total)	mg/kg	1	300	400	300	-	<0.8	<0.8	<0.8	1.3	<0.8	<0.8
OCPs												
Hexachlorobenzene (HCB)	mg/kg	0.1	10	15	10	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	6	10	10	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	6	10	10	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.1				-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	270	400	340	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Beta Endosulfan	mg/kg	0.1				-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1				-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	mg/kg	0.1	50	90	70	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1				-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
p,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	NA	<0.2	<0.2	<0.2	<0.2
p,p'-DDE	mg/kg	0.1					<0.1	NA	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	mg/kg	0.1					<0.1	NA	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	NA	<0.2	<0.2	<0.2	<0.2
o,p'-DDE	mg/kg	0.1					<0.1	NA	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	mg/kg	0.1					<0.1	NA	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.1	10	20	20	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	300	500	400	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	-	-	-	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	10	20	20	-	<0.1	NA	<0.1	<0.1	<0.1	<0.1
OPPs												
Dichlorvos	mg/kg	0.5	-	-	-	-	<0.5	NA	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	-	-	-	-	<0.5	NA	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	-	-	-	-	<0.5	NA	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	160	340	250	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	-	-	-	-	<0.5	NA	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
PCBs												
Arochlor 1016	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	-	-	-	-	<0.2	NA	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	1	1	1	-	<1	NA	<1	<1	<1	<1
Metals												
Arsenic	mg/kg	3	100	500	300	100	12	12	9	77	17	<3
Cadmium	mg/kg	0.3	20	150	90	-	1	1.1	0.6	0.4	1.6	<0.3
Chromium	mg/kg	0.3	100	500	300	570	110	81	85	21	160	76
Copper	mg/kg	0.5	6,000	30000	17000	280	26	35	23	58	51	19
Lead	mg/kg	1	300	1200	600	1100	230	350	230	82	680	10
Mercury	mg/kg	0.01	40	120	80	-	0.24	0.1	0.09	0.08	0.25	<0.05
Nickel	mg/kg	0.5	400	1200	1200	350	4.5	8.4	35	11	28	66
Zinc	mg/kg	0.5	7,400	60000	30000	880	490	510	440	830	460	44
Asbestos												
Asbestos Detected - Fibre Identification in soil	No unit	0	No Detected	No Detected	No Detected	-	No	NA	No	No	No	No
Estimated Fibres - Fibre Identification in soil	%w/w	0.01	0.01	0.04	0.02	-	<0.01	NA	<0.01	<0.01	<0.01	<0.01
Asbestos Detected - Fibre ID in bulk materials (cement fragment)	No unit	0	No Detected	No Detected	No Detected	-	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Table 1A(1), HIL Column 1 - Health Based Investigation Levels for Residential with Garden/Accessible Soil - NEHF A (NEPC, 2013)
2 - Table 1A(3), HSL A & HSL B Column 1 (Sand 0 m to <1 m) - Soil HSLs for Vapour Intrusion for Low – High Density Residential - NEHF B (NEPC, 2013)
3 - Table 1A(1), HIL Column 2 - Health Based Investigation Levels for Residential with minimal opportunities for soil access - NEHF B (NEPC, 2013)
4 - Table 1A(1), HIL Column 3 - Health Based Investigation Levels for (Recreational) Public Open Space such as parks, playgrounds, playing fields - NEHF C (NEPC, 2013)
5 - Tables 1B(1), 1B(2), 1B(3), 1B(4), 1B(5) and 1B(6), EILs and ESLs - Urban Residential/Public Open Space (NEPC, 2013)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
40

Table A - Soil Analytical Results

Laboratory ID							SE173824.001	SE173824.002	SE173824.003	SE173782.024	SE173782.025	SE173782.026
Sample ID							BH7/0.2-0.3	BH8/0.2-0.3	BH9/0.2-0.3	BH10/0.2-0.3	BH11/0.2-0.3	BH12/0.2-0.3
Depth (m)							0.2 - 0.3	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3	0.2 - 0.3
Soil Type							Fill: Clay & Sand	Fill: Clay & Sand	Fill: Clay & Sand	Fill: Clay & Sand	Fill: Clay & Sand	Fill: Clay & Sand
Date Sampled							15/12/2017	15/12/2017	15/12/2017	14/12/2017	14/12/2017	14/12/2017
			NEPM 2013									
Compounds	**Unit**	**EQL**	**Residential HIL A[1]**	**Residential HIL B[3]**	**Recreational HIL C[3]**	**Urban Residential and Public Open Space - EIL [4]**						
TRHs												
TRH C6-C9	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TPH C6-C10 less BTEX (F1)	mg/kg	25	45 [2]	45 [2]	-	180	<25	<25	<25	<25	<25	<25
TRH C10-C14	mg/kg	20	-	-	-	-	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	-	-	-	-	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	-	-	-	-	<45	<45	60	<45	<45	<45
TRH C37-C40	mg/kg	100	-	-	-	-	<100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	-	-	-	-	<25	<25	<25	<25	<25	<25
TRH >C10-C16 less Naphthalene (F2)	mg/kg	25	110 [2]	110 [2]	-	120	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	300	<90	<90	91	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	2800	<120	<120	<120	<120	<120	<120
TRH >C10-C36	mg/kg	110	-	-	-	-	<110	<110	<110	<110	<110	<110
TRH >C10-C40	mg/kg	210	-	-	-	-	<210	<210	<210	<210	<210	<210
BTEX												
Benzene	mg/kg	0.1	0.5 [2]	0.5 [2]	-	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	55 [2]	55 [2]	-	70	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	160 [2]	160 [2]	-	85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	40 [2]	40 [2]	-	105	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
PAHs												
Naphthalene	mg/kg	0.1	3 [2]	3 [2]	-	170	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	-	-	-	0.7	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	3	4	3	-	<0.2	<0.2	0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	3	4	3	-	<0.3	<0.3	0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	3	4	3	-	<0.2	<0.2	0.3	<0.2	<0.2	<0.2
PAHs (Sum of total)	mg/kg	1	300	400	300	-	<0.8	<0.8	1.5	<0.8	<0.8	<0.8
OCPs												
Hexachlorobenzene (HCB)	mg/kg	0.1	10	15	10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	6	10	10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	6	10	10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	270	400	340	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Beta Endosulfan	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	mg/kg	0.1	50	90	70	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1				-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDE	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.2	240	600	400	180	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDE	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.1	10	20	20	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	300	500	400	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	10	20	20	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
OPPs												
Dichlorvos	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	160	340	250	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PCBs												
Arochlor 1016	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	1	1	1	-	<1	<1	<1	<1	<1	<1
Metals												
Arsenic	mg/kg	3	100	500	300	100	7	4	10	4	5	5
Cadmium	mg/kg	0.3	20	150	90	-	<0.3	<0.3	0.4	<0.3	<0.3	<0.3
Chromium	mg/kg	0.3	100	500	300	570	28	2	47	5.2	8	9.2
Copper	mg/kg	0.5	6,000	30000	17000	280	12	160	31	3.3	3.9	4.3
Lead	mg/kg	1	300	1200	600	1100	13	4	50	8	5	7
Mercury	mg/kg	0.01	40	120	80	-	<0.05	<0.05	0.06	<0.05	<0.05	<0.05
Nickel	mg/kg	0.5	400	1200	1200	350	3.4	3.7	10	1	1.4	6.9
Zinc	mg/kg	0.5	7,400	60000	30000	880	97	24	100	26	41	30
Asbestos												
Asbestos Detected - Fibre Identification in soil	No unit	0	No Detected	No Detected	No Detected	-	NA	NA	NA	NA	NA	NA
Estimated Fibres - Fibre Identification in soil	%w/w	0.01	0.01	0.04	0.02	-	NA	NA	NA	NA	NA	NA
Asbestos Detected - Fibre ID in bulk materials (cement fragment)	No unit	0	No Detected	No Detected	No Detected	-	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Table 1A(1), HIL Column 1 - Health Based Investigation Levels for Residential with Garden/Accessible Soil - NEHF A (NEPC, 2013)
2 - Table 1A(3), HSL A & HSL B Column 1 (Sand 0 m to <1 m) - Soil HSLs for Vapour Intrusion for Low – High Density Residential - NEHF B (NEPC, 2013)
3 - Table 1A(1), HIL Column 2 - Health Based Investigation Levels for Residential with minimal opportunities for soil access - NEHF B (NEPC, 2013)
4 - Table 1A(1), HIL Column 3 - Health Based Investigation Levels for (Recreational) Public Open Space such as parks, playgrounds, playing fields - NEHF C (NEPC, 2013)
5 - Tables 1B(1), 1B(2), 1B(3), 1B(4), 1B(5) and 1B(6), EILs and ESLs - Urban Residential/Public Open Space (NEPC, 2013)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
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Table A - Soil Analytical Results

Laboratory ID							SE173782.022	SE173782.023
Sample ID							PACM1	PACM2
Depth (m)							0.2 - 0.3	0.0
Soil Type							Bonded Fibro Fragment	
Date Sampled							13/12/2017	14/12/2017
			NEPM 2013					
Compounds	Unit	EQL	Residential HIL A[1]	Residential HIL B[3]	Recreational HIL C[3]	Urban Residential and Public Open Space - EIL[4]		
TRHs								
TRH C6-C9	mg/kg	20	-	-	-	-	NA	NA
TRH C6-C10	mg/kg	25	-	-	-	-	NA	NA
TPH C6-C10 less BTEX (F1)	mg/kg	25	45 [2]	45 [2]	-	180	NA	NA
TRH C10-C14	mg/kg	20	-	-	-	-	NA	NA
TRH C15-C28	mg/kg	45	-	-	-	-	NA	NA
TRH C29-C36	mg/kg	45	-	-	-	-	NA	NA
TRH C37-C40	mg/kg	100	-	-	-	-	NA	NA
TRH >C10-C16	mg/kg	25	-	-	-	-	NA	NA
TRH >C10-C16 less Naphthalene (F2)	mg/kg	25	110 [2]	110 [2]	-	120	NA	NA
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	300	NA	NA
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	2800	NA	NA
TRH >C10-C36	mg/kg	110	-	-	-	-	NA	NA
TRH >C10-C40	mg/kg	210	-	-	-	-	NA	NA
BTEX								
Benzene	mg/kg	0.1	0.5 [2]	0.5 [2]	-	50	NA	NA
Ethylbenzene	mg/kg	0.1	55 [2]	55 [2]	-	70	NA	NA
Toluene	mg/kg	0.1	160 [2]	160 [2]	-	85	NA	NA
Xylene (m & p)	mg/kg	0.2	-	-	-	-	NA	NA
Xylene (o)	mg/kg	0.1	-	-	-	-	NA	NA
Xylene Total	mg/kg	0.3	40 [2]	40 [2]	-	105	NA	NA
PAHs								
Naphthalene	mg/kg	0.1	3 [2]	3 [2]	-	170	NA	NA
2-methylnaphthalene	mg/kg	0.1	-	-	-	-	NA	NA
1-methylnaphthalene	mg/kg	0.1	-	-	-	-	NA	NA
Acenaphthylene	mg/kg	0.1	-	-	-	-	NA	NA
Acenaphthene	mg/kg	0.1	-	-	-	-	NA	NA
Fluorene	mg/kg	0.1	-	-	-	-	NA	NA
Phenanthrene	mg/kg	0.1	-	-	-	-	NA	NA
Anthracene	mg/kg	0.1	-	-	-	-	NA	NA
Fluoranthene	mg/kg	0.1	-	-	-	-	NA	NA
Pyrene	mg/kg	0.1	-	-	-	-	NA	NA
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-	NA	NA
Chrysene	mg/kg	0.1	-	-	-	-	NA	NA
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-	NA	NA
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-	NA	NA
Benzo(a)pyrene	mg/kg	0.1	-	-	-	0.7	NA	NA
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-	NA	NA
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	-	-	NA	NA
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-	NA	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	TEQ	0.2	3	4	3	-	NA	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	TEQ (mg/kg)	0.3	3	4	3	-	NA	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	TEQ (mg/kg)	0.2	3	4	3	-	NA	NA
PAHs (Sum of total)	mg/kg	1	300	400	300	-	NA	NA
OCPs								
Hexachlorobenzene (HCB)	mg/kg	0.1	10	15	10	-	NA	NA
Lindane	mg/kg	0.1	-	-	-	-	NA	NA
Heptachlor	mg/kg	0.1	6	10	10	-	NA	NA
Aldrin	mg/kg	0.1	6	10	10	-	NA	NA
Dieldrin	mg/kg	0.1				-	NA	NA
Alpha BHC	mg/kg	0.1	-	-	-	-	NA	NA
Beta BHC	mg/kg	0.1	-	-	-	-	NA	NA
Delta BHC	mg/kg	0.1	-	-	-	-	NA	NA
Heptachlor epoxide	mg/kg	0.1	-	-	-	-	NA	NA
Alpha Endosulfan	mg/kg	0.2	270	400	340	-	NA	NA
Beta Endosulfan	mg/kg	0.1				-	NA	NA
Endosulfan sulphate	mg/kg	0.1				-	NA	NA
Gamma Chlordane	mg/kg	0.1	50	90	70	-	NA	NA
Alpha Chlordane	mg/kg	0.1				-	NA	NA
trans-Nonachlor	mg/kg	0.2	-	-	-	-	NA	NA
p,p'-DDT	mg/kg	0.2	240	600	400	180	NA	NA
p,p'-DDE	mg/kg	0.1					NA	NA
p,p'-DDD	mg/kg	0.1					NA	NA
o,p'-DDT	mg/kg	0.2	240	600	400	180	NA	NA
o,p'-DDE	mg/kg	0.1					NA	NA
o,p'-DDD	mg/kg	0.1					NA	NA
Endrin	mg/kg	0.1	10	20	20	-	NA	NA
Endrin Aldehyde	mg/kg	0.1	-	-	-	-	NA	NA
Methoxychlor	mg/kg	0.1	300	500	400	-	NA	NA
Endrin Ketone	mg/kg	0.1	-	-	-	-	NA	NA
Isodrin	mg/kg	0.1	-	-	-	-	NA	NA
Mirex	mg/kg	0.1	10	20	20	-	NA	NA
OPPs								
Dichlorvos	mg/kg	0.5	-	-	-	-	NA	NA
Dimethoate	mg/kg	0.5	-	-	-	-	NA	NA
Diazinon (Dimpylate)	mg/kg	0.5	-	-	-	-	NA	NA
Fenitrothion	mg/kg	0.2	-	-	-	-	NA	NA
Malathion	mg/kg	0.2	-	-	-	-	NA	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	160	340	250	-	NA	NA
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-	-	-	NA	NA
Bromophos Ethyl	mg/kg	0.2	-	-	-	-	NA	NA
Methidathion	mg/kg	0.5	-	-	-	-	NA	NA
Ethion	mg/kg	0.2	-	-	-	-	NA	NA
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-	-	-	NA	NA
PCBs								
Arochlor 1016	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1221	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1232	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1242	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1248	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1254	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1260	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1262	mg/kg	0.2	-	-	-	-	NA	NA
Arochlor 1268	mg/kg	0.2	-	-	-	-	NA	NA
Total PCBs (Arochlors)	mg/kg	1	1	1	1	-	NA	NA
Metals								
Arsenic	mg/kg	3	100	500	300	100	NA	NA
Cadmium	mg/kg	0.3	20	150	90	-	NA	NA
Chromium	mg/kg	0.3	100	500	300	570	NA	NA
Copper	mg/kg	0.5	6,000	30000	17000	280	NA	NA
Lead	mg/kg	1	300	1200	600	1100	NA	NA
Mercury	mg/kg	0.01	40	120	80	-	NA	NA
Nickel	mg/kg	0.5	400	1200	1200	350	NA	NA
Zinc	mg/kg	0.5	7,400	60000	30000	880	NA	NA
Asbestos								
Asbestos Detected - Fibre Identification in soil	No unit	0	No Detected	No Detected	No Detected	-	NA	NA
Estimated Fibres - Fibre Identification in soil	%w/w	0.01	0.01	0.04	0.02	-	NA	NA
Asbestos Detected - Fibre ID in bulk materials (cement fragment)	No unit	0	No Detected	No Detected	No Detected	-	Yes	Yes

NOTES:
All concentrations are in mg/kg
1 - Table 1A(1), HIL Column 1 - Health Based Investigation Levels for Residential with Garden/Accessible Soil - NEHF A (NEPC, 2013)
2 - Table 1A(3), HSL A & HSL B Column 1 (Sand 0 m to <1 m) - Soil HSLs for Vapour Intrusion for Low – High Density Residential - NEHF B (NEPC, 2013)
3 - Table 1A(1), HIL Column 2 - Health Based Investigation Levels for Residential with minimal opportunities for soil access - NEHF B (NEPC, 2013)
4 - Table 1A(1), HIL Column 3 - Health Based Investigation Levels for (Recreational) Public Open Space such as parks, playgrounds, playing fields - NEHF C (NEPC, 2013)
5 - Tables 1B(1), 1B(2), 1B(3), 1B(4), 1B(5) and 1B(6), EILs and ESLs - Urban Residential/Public Open Space (NEPC, 2013)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
40

Table B - Soil RPD Values

Sample Location		S1			S1			S8		
Sample ID		S1	QC1A (Duplicate of S1)	RPD	S1	QC1B (Triplicate of S1)	RPD	S8	QC2A (Duplicate of S8)	RPD
Depth (mBGS)		0.0-0.2			0.0-0.2			0.0-0.2		
Date Sampled		13/12/2017			13/12/2017			14/12/2017		
Compounds	EQL/PQL									
BTEX										
Benzene	0.1	<0.1	<0.1	NA	<0.1	<0.2	NA	<0.1	<0.1	NA
Ethylbenzene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Toluene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Xylene (m & p)	0.2	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA
Xylene (o)	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
TPHs										
TRH C6-C9	20	<20	<20	NA	<20	<10	NA	<20	<20	NA
TRH C6-C10	25	<25	<25	NA	<25	<10	NA	<25	<25	NA
TPH C6-C10 less BTEX (F1)	25	<25	<25	NA	<25	<10	NA	<25	<25	NA
TRH C10-C14	20	<20	<20	NA	<20	<50	NA	<20	<20	NA
TRH C15-C28	45	<45	<45	NA	<45	<100	NA	<45	<45	NA
TRH C29-C36	45	<45	<45	NA	<45	<100	NA	<45	<45	NA
TRH C37-C40	100	<100	<100	NA	<100	NA	NA	<100	<100	NA
TRH >C10-C16 (F2)	25	<25	<25	NA	<25	<50	NA	<25	<25	NA
TRH >C10-C16 less Naphthalene (F2)	25	<25	<25	NA	<25	<50	NA	<25	<25	NA
TRH >C16-C34	90	<90	<90	NA	<90	<100	NA	<90	<90	NA
TRH >C34-C40	120	<120	<120	NA	<120	<100	NA	<120	<120	NA
TRH >C10-C36	110	<110	<110	NA	<110	<50	NA	<110	<110	NA
TRH >C10-C40	210	<210	<210	NA	<210	<50	NA	<210	<210	NA
PAHs										
Naphthalene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
2-methylnaphthalene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
1-methylnaphthalene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Acenaphthylene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Acenaphthene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Fluorene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Phenanthrene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Anthracene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Fluoranthene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Pyrene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Chrysene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Benzo(b&j)fluoranthene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Benzo(k)fluoranthene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Benzo(a)pyrene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Indeno(1,2,3-cd)pyrene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Dibenzo(a&h)anthracene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Benzo(ghi)perylene	0.1	<0.1	<0.1	NA	<0.1	<0.5	NA	<0.1	<0.1	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0	0.2	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR	0.05	<0.3	<0.3	NA	<0.3	0.6	NA	<0.3	<0.3	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2	0.1	<0.2	<0.2	NA	<0.2	1.2	NA	<0.2	<0.2	NA
PAHs (Sum of total)	0.1	<0.8	<0.8	NA	<0.8	<0.5	NA	<0.8	<0.8	NA
OCPs										
Hexachlorobenzene (HCB)	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Alpha BHC	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Lindane	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Heptachlor	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Aldrin	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Beta BHC	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Delta BHC	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Heptachlor epoxide	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
o,p'-DDE	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Alpha Endosulfan	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Gamma Chlordane	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Alpha Chlordane	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
trans-Nonachlor	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
p,p'-DDE	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Dieldrin	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Endrin	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
o,p'-DDD	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
o,p'-DDT	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Beta Endosulfan	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
p,p'-DDD	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
p,p'-DDT	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Endosulfan sulphate	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Endrin Aldehyde	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Methoxychlor	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Endrin Ketone	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Isodrin	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Mirex	0.1	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
OPPs										
Dichlorvos	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Dimethoate	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Diazinon (Dimpylate)	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Fenitrothion	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Malathion	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Parathion-ethyl (Parathion)	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Bromophos Ethyl	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Methidathion	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Ethion	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Azinphos-methyl (Guthion)	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
PCBs										
Arochlor 1016	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1221	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1232	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1242	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1248	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1254	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1260	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1262	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Arochlor 1268	0.2	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA
Metals										
Arsenic	3	20	18	11%	20	16	22%	5	6	18%
Cadmium	0.3	0.8	0.7	13%	0.8	<0.1	NA	<0.3	<0.3	NA
Chromium	0.3	16	15	6%	16	16	0%	87	37	**81%**
Copper	0.5	28	28	0%	28	27	4%	6.7	6.9	3%
Lead	1	73	63	15%	73	64	13%	69	66	4%
Mercury	0.0	0.1	0.09	11%	0.1	0.1	0%	0.09	0.08	12%
Nickel	0.5	8.3	8.4	1%	8.3	9	8%	3.8	3.8	0%
Zinc	0.5	150	180	18%	150	152	1%	77	120	**44%**

NOTES:
All concentrations are in mg/kg
RPDs have only been considered where a concentration is greater than 5 times the EQL.

RPD result exceeding acceptance criteria for organics - 50%; inorganics - 30%
RPD results exceeding the acceptance criteria but were disregarded if primary or duplicate sample results were <5 x EQL
Reference: Australian Standard, Guide to the Investigation and Sampling of Potentially Contaminated Soil (AS4482.1-2005 and AS4482.2-1999)
#/# - Primary lab EQL/Secondary lab EQL
"-" indicates that these samples were not analysed
NA - Calculation not applicable or RPD=0
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table C - Calculation of 95%UCL (in accordance with Sampling Design Guidelines, NSW EPA, September 1995)			
Method based on Central Limit Theorem (Procedure D in Guidelines)			
N, number of datapoints	30	30	30
Average of dataset	102.4	36.7	75.7
Standard deviation of dataset	65.7	37.2	139.0
Student t test value at p=0.05	1.70	1.70	1.70
95%UCL - Based on Central Limit Theorem (default)	**122.7**	**48.2**	**118.8**
Method for data with Log-Normal distribution (used only when coefficient of variation>1.2, data are log-normal and result is realistic - Procedure G in Guidelines)			
Coefficient of variation (critical value 1.2):	0.64	1.01	1.84
Shapiro-Wilk test, data likely to be normal (p=0.05)?			
Shapiro-Wilk test, data likely to be log-normal (p=0.05)?			
Maximum concentration	450	160	680
Is result realistic? (95%UCL < 1.2 x maximum)	Yes	Yes	Yes
Use 95%UCL based on log-normal distribution?	No	No	
95%UCL - Based on Log-Normal distribution	**109.9**	**62.8**	**144.0**
95%UCL for dataset	**122.7**	**48.2**	#DIV/0!

Sample ID	**Compound (mg/kg)**		
	TRH C16-C34 less BTEX (F3)	*Chromium*	*Lead*
TP1/0.5-1.0	<90	42	21
TP2/0.3-1.0	<90	20	31
TP3/0.2-0.3	450	13	19
TP4/0.2-0.3	<90	15	12
TP5/0.2-0.3	<90	4	40
TP6/0.2-0.3	<90	46	14
TP7/0.2-0.3	<90	15	9
S1	<90	16	73
QC1A	<90	15	63
QC1B	<100	16	64
S2	<90	18	9
S3	<90	26	10
S4	<90	9	12
S5	<90	58	69
S6	<90	11	7
S7	<90	20	14
S8	<90	87	69
QC2A	<90	37	66
S9	<90	110	230
S10	<90	81	350
SH1	<90	85	230
SH2	<90	21	82
SH3	<90	160	680
SH4	<90	76	10
BH7/0.2-0.3	<90	28	13
BH8/0.2-0.3	<90	2	4
BH9/0.2-0.3	91	47	50
BH10/0.2-0.3	<90	5	8
BH11/0.2-0.3	<90	8	5
BH12/0.2-0.3	<90	9	7

Appendix A – Proposed Development Plans

3.0 Proposal

3.1 Proposed development

The proposed development involves the restoration of the historic Heathcote Hall including identified historical curtilage, gardens and landscaping in accordance with the submitted Conservation Management Plan (CMP). The proposal also nominates the demolition of redundant existing structures and vegetation which are identified on the demolition plan submitted with this application.

The included CMP also identifies the constraints and opportunities for areas of development that will not undermine the historical significance of Heathcote Hall. The CMP has defined an area which is suitable for redevelopment which permits the opportunity to provide townhouses, apartments and basement parking to offset the funding required to fully undertake the restoration of the state significant historical Heathcote Hall. The development application proposes (post demolition works - refer attached plan) and as detailed in the architectural plans prepared by Ink Architects;

Heritage Precinct

1. Restoration of Heathcote Hall Building
2. Renew turf and reinstate pleasure gardens
3. Reinstate pathways
4. Support landscaping regeneration area
5. Introduce a Community kitchen gardens and orchard

Development Precinct

1. 36 Town Houses at 2 storeys
2. 3 storey building A - 15 units
3. 2 storey building B - 6 units
4. Basement car parking accessed from Boronia Grove and Dillwynnia Grove
5. Landscaping
6. Associated earthworks

3.2 Landscaping

A detailed Landscape Plan prepared by Site Design has been submitted with the application. The Landscape Plan outlines the design treatment for private and communal landscaped areas of the site. The proposal includes new vegetation throughout the site including planting adjacent to the common driveway and increased perimeter planting to complement and soften the proposed built form.

Existing site and street trees, including those to be retained, removed and relocated are indicated on the Landscape Plan. The Landscape Plan should be read in conjunction with the Arborist Report prepared by Ross Jackson Nature Works.

3.3 Parking, Access & Public Transport

The proposed development will provide a total of 134 car parking spaces, with storage areas, and visitor spaces and additional 7 motorcycle parking spaces. Access to the new development precinct is via the proposed driveways from Boronia Grove, Tacoma Street and Dillwynnia Grove.

The site is located within walking distance to bus stops and Heathcote railway station providing public transport to Sydney CBD, Wollongong and Cronulla. Transdev provides the bus service for route 996 which is the Engadine to Heathcote East (loop service).

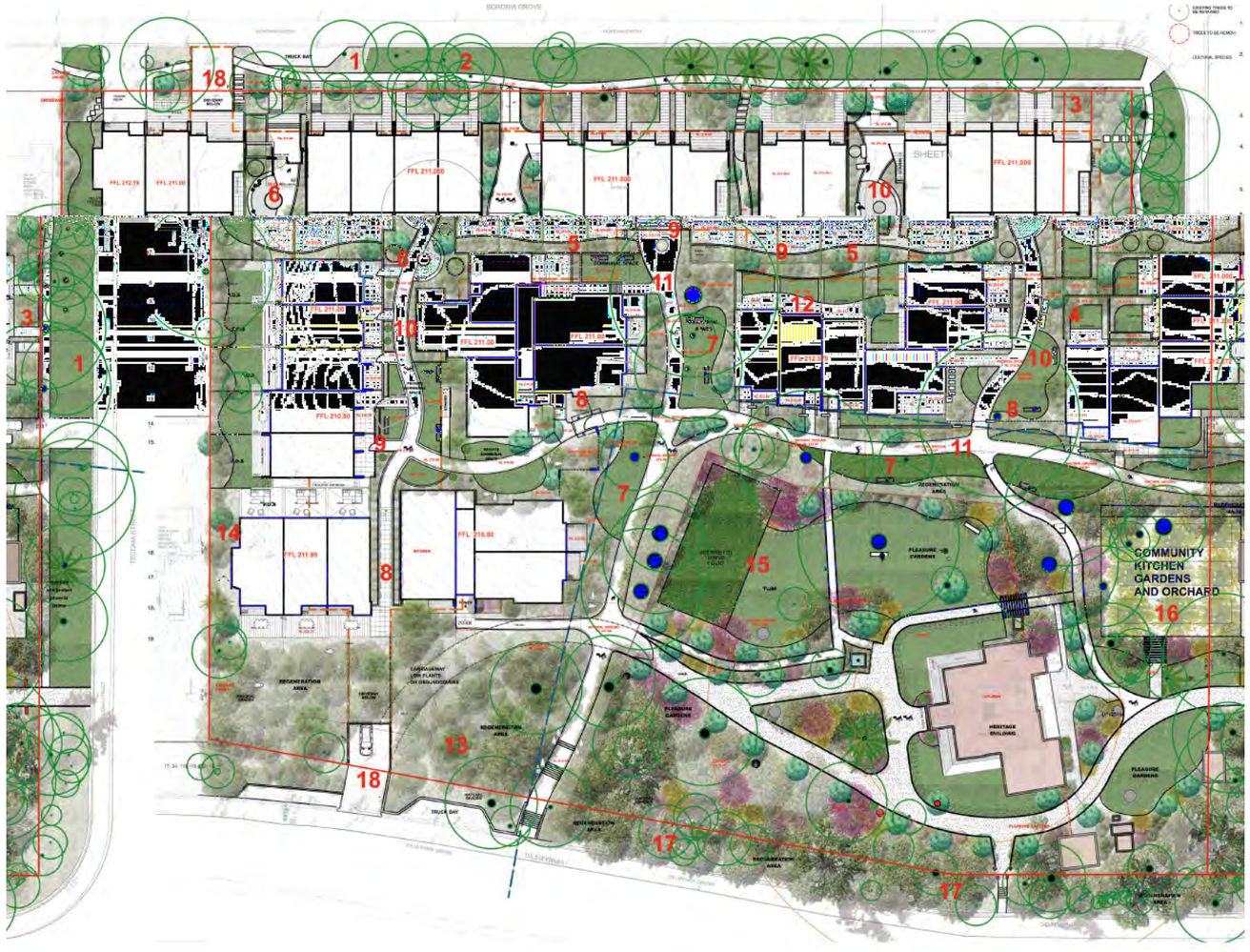

Figure 4 - Masterplan

Appendix B – Data Validation

B1 Introduction

The following sections describe the components of the Quality Assurance and Quality Control Plan that assess the achievement of the DQOs set out in **Section 5** by consideration of the data quality indicators – DQIs (precision, accuracy, reproducibility, completeness and comparability).

B2 Data Quality Indicators

The project DQIs have been established to set acceptance limits on field and laboratory data collected as part of these DESI works. For both field and laboratory procedures, acceptance limits are set at different levels for different projects and by the laboratories.

Non-compliances with acceptance limits are to be documented and discussed in the report. The DQIs are as follows:

DQI	Field	Laboratory	Acceptability Limits
Precision	Sampling methodologies appropriate and complied with. Collection of intra-laboratory duplicate and inter-laboratory duplicate samples	Analysis of: Field intra-laboratory duplicate samples (1 in 10 samples) Field inter-laboratory duplicate samples (1 in 20 samples) Laboratory duplicate samples Laboratory prepared trip spikes	 RPD of < 50% RPD of < 50% RPD of < 50% Recovery >90%
Accuracy	Sampling methodologies appropriate and complied with. Collection of rinsate blanks	Analysis of: Rinsate blanks (1/day/equipment) Method blanks Matrix spikes Matrix spike duplicates Laboratory control samples Surrogate spikes Reference Materials	 Non-detect for CoC Non-detect for CoC 70 to 130% RPD of <50% 70 to 130 % 70 to 130% Varies

DQI	Field	Laboratory	Acceptability Limits
Representativeness	Appropriate media sampled according to LG methodologies All media identified in the methodology section sampled.	All samples analysed according to LG discretion and based on Section 2.2 of this report.	All samples analysed according to the LG and laboratory methodologies.
Comparability	Same sampling methodologies used on each day of sampling Experienced sampler Climatic conditions Same types of samples collected	Same analytical methods used (including clean-up) Sample laboratory detection limits (justify/quantify if different) Same laboratories (NATA accredited) Same units	As per NEPC (1999c) < nominated criteria where applicable
Completeness	All critical locations and media sampled All samples collected Sampling methodologies appropriate and complied with Experienced sampler Documentation correct	All critical samples analysed and all analytes analysed according to the methodology section. Appropriate methods Appropriate laboratory detection limits Sample documentation complete Sample holding times complied with	As per NEPC (1999c) < nominated criteria where applicable As per NEPC (1999b)

An assessment of field and laboratory QA/QC data and clarification of the degree to which each of these aspects above was met is provided in **Section F5**.

B3 Field QA / QC

B3.2 Sample Collection

B3.2.1 Soil Samples

During the test pitting soil boring works, samples were generally collected from the fill materials between 0.0 to 1.5 m bgs and from natural soils between 0.5 to 1.5 m bgs. At least one sample was collected from each borehole location from the fill materials and one sample from the natural soils.

Test pitting through the fill materials and into natural soil materials was completed using a 13 tonne excavator. Soil samples were collected directly from the gouge auger tube using a hand protected by a nitrile glove and placed immediately into a laboratory prepared 125 mL glass jar.

Where sufficient material allowed, additional materials were placed into a sealed plastic bag and left for five minutes for the vapours to equilibrate. The bag was then screened with a calibrated photo-ionisation detector (PID) to give an indication of the level of volatile organic compounds (VOCs) within the materials sampled. PID readings were taken from each sample as well as from areas that produced an odour during drilling.

Field intra-laboratory duplicates of the soil were prepared in the field by collecting separate samples from the gauge auger tubes from the same depth. A duplicate of the soil sample was prepared in the field by splitting the sample. Samples were not mixed or homogenised during collection or splitting. The sample for duplicate analysis was selected from a sampling location showing high probability of containing contaminants of concern, i.e., samples characterised by potentially contaminating activities, odours and/or elevated PID responses.

B3.3 Sample Handling and Preservation

During sampling, a new pair of disposable nitrile sampling gloves was donned between each sampling location and depth. Samples were placed immediately into a laboratory prepared and supplied container in accordance with the methodology described in **Section B3.2** above.

Soil and groundwater samples were placed in a chilled, insulated container with ice between sampling and analysis.

Sample numbers, depths, preservation and analytical requirements were recorded on the chain-of-custody documentation (signed copies provided with the laboratory reports in **Appendix C**), which accompanied the samples to the laboratory.

B3.4 Calibration

PID

During the field investigation, calibration of the photoionisation detector (PID) was undertaken in accordance with manufacturer's instructions. The PID was calibrated prior to delivery by the supplier (Airmet Scientific) and calibration was undertaken at the start of each sampling day by LG. All calibration results were satisfactory.

F3.5 Intra-laboratory and Inter-laboratory Replicate Samples

The purpose of field replicate samples is to estimate the variability of a given characteristic or contaminant associated with a population. Intra-laboratory and inter-laboratory replicate samples were collected and analysed at a rate of at least one (1) in twenty (20) primary samples.

The actual intra-laboratory replicate and inter-laboratory replicate sample frequency was as follows:

- **Soil:**
  - Two (2) duplicate (intra-laboratory replicate) samples (for 27 primary samples), meeting the 5% sampling rate requirement in AS 4482. All were analysed for 8 metals, TRH, and BTEX, PAH, PCB and OCP/OPP to match the primary sample analytical suite. Duplicate analysis for asbestos was not conducted and LG considered it acceptable due to discrete nature of ACM impacts.
  - One (1) triplicate (inter-laboratory replicate) sample (for 27 primary samples), meeting the 5% sampling rate requirement in AS 4482. All were analysed for metals with selected pairs analysed for 8 metals, TRH, BTEX. PAH, PCB and OCP/OPP to match the primary sample analytical suite were not analysed in the duplicate samples. Duplicate analysis for asbestos was not conducted and LG considered it acceptable due to discrete nature of ACM impacts.
  - No trip blank or trip spike samples were analysed as LG considered that volatile contaminants were not a primary concern.

Field replicated soil samples were obtained from similar matrix of an identical depth and immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two sample containers. The replicate samples were labelled to conceal their relationship to the primary sample from the laboratory and the key to the replicate samples were recorded in the field note book.

It is common that significant variation in replicate results is often observed (particularly for solid matrix samples) due to sample heterogeneity or low reported concentrations near the EQL. The overall precision of field replicates, laboratory split samples and laboratory duplicates is generally assessed by their Relative Percent Difference (RPD), given by:

$$\text{RPD} = \frac{(\text{D1} - \text{D2})}{\frac{(\text{D1} + \text{D2})}{2}} \text{X } 100$$

where D1 is the primary sample measurement

D2 is the replicate sample measurement

It is expected that RPD's would be less than 50% for organic compounds and less than 30% for inorganic compounds, and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required. A summary of the calculations for RPDs for soils are presented in **Table B**.

It is noted that there were the following exceedances relative to the RPD criteria and these RPD exceedances are likely due to heterogeneity of the fill materials sampled:

- S8 and QC2A (duplicate) – chromium and zinc.

B3.6 Decontamination and Rinsate Blanks

B3.6.1 Soil Sampling

During test pitting and soil bore sampling works, the excavator bucket and drilling equipment was re-used. The excavator bucket was decontaminated by hand between each sampling location by scrubbing with an aqueous solution of Decon 90 followed by a rinse in potable water. The augers were sprayed with an aqueous solution of Decon 90 followed by a rinse in potable water. Given that samples were collected directly from the dedicated push tube using single-use gloves and no-reuseable sampling equipment came into contact with the soil sampled minimal rinsate blanks were considered necessary during the soil investigation works.

B4 Laboratory QA/QC

B4.1 Analytical Laboratory

Samples were submitted to the SGS, Alexandria, NSW (primary laboratory) and ALS, Smithfield, NSW (secondary laboratory).

SGS and ALS are NATA-accredited laboratories and their analytical procedures are based on established internationally-recognised procedures such as those published by the US EPA, APHA, AS and NEPM (2013).

SGS and ALS analytical procedures are based on methods referenced from published sources including the US EPA APHA, AS and NEPM (2013).

B4.2 Analytical Methods

The laboratory analysis methods are provided on the laboratory certificates in **Appendix C** and summarised below:

Soil Analytical Method:

Analysis	SGS and ALS Laboratories	
	Standard Estimated Quantitation Limit	Reference Method
TRHs	25-100 mg/kg	Extraction with DCM/Acetone or MeOH then PT-GC/FID or GC/MS (USEPA 3510, 8015)
BTEX	0.2-2 mg/kg	Methanolic extraction then PT-GC/MS (USEPA 5030, 8260)
PAHs OCPs OPPs PCBs	0.05-0.2 mg/kg	Extraction with DCM/Acetone then GC/MS (USEPA 3510, 8270)
Metals	0.5-4 mg/kg	ICP/AES (USEPA 6020)
Asbestos	0.2-2 mg/kg	ASB-001 - Asbestos ID - Qualitative identification of

Analysis	SGS and ALS Laboratories	
	Standard Estimated Quantitation Limit	Reference Method
		asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004

Note:
DCM= Dichloromethane
GC= Gas Chromatography
MS = Mass Spectrometry
ICP = Inductively Coupled Plasma
FI =Flame Injection

B4.3 Laboratory (Method) Blanks

Laboratory or control blanks consist of reagents specific to each individual analytical method and are prepared and analysed by laboratories in the same manner as regular samples. The preparation and analysis of laboratory blanks enables the measurement of contamination within the laboratory.

Laboratory blanks are typically analysed at a frequency of 1 in 10, with a minimum of one analysed per batch.

Review of laboratory QA/QC reports indicated that the results for all method blanks for both soil and groundwater were below the laboratory EQLs.

B4.4 Laboratory Duplicates

Laboratory duplicate samples are prepared in the laboratory by splitting a field sample and analysing it as two independent samples. The analysis of laboratory duplicate samples provides an indication of analytical precision and may be influenced by sample heterogeneity. The laboratory duplicate RPDs are used to assess laboratory precision.

Laboratory duplicates are typically analysed at a frequency of 1 in 10, with a minimum of one analysed per batch.

B4.5 Laboratory Control Samples

Laboratory control samples (LCS) or Quality Control check samples are prepared within the laboratory by spiking an aliquot of an appropriate clean matrix reagent with known concentrations of specific analytes. The LCS sample is then analysed and the results are used to assess the laboratory performance on sample preparation and analysis procedure. Certified reference material may also be used to assess analytical accuracy independent of the investigations. Accuracy is assessed by calculation of percent recovery.

LCSs are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per analytical batch.

Reviews of the laboratory QA/QC reports indicated that the percent recoveries for laboratory control samples ranged from 70% to 137% which are within the acceptance criteria.

B4.6 Matrix Spikes

Matrix spikes are samples prepared within the laboratory by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes. The matrix spike and matrix spike duplicate are then analysed separately and the results compared to determine the effects of the sample matrix on the accuracy and precision of the analytes.

Accuracy is assessed by the calculation of the percent recovery.

B4.7 Surrogates

Surrogates are compounds which are similar to the organic analytes of interest in chemical composition, extraction, and chromatographic behaviour, but which are not normally found in field samples.

Surrogates are generally spiked into all sample aliquots prior to preparation and analysis by chromatogaphic methods.

Percent recoveries are calculated for each surrogate, providing an indication of analytical accuracy. US EPA methodology (SW – 846) requires that surrogate testing be performed whenever analysing by Gas Chromatography or HPLC.

Review of the laboratory QA/QC reports indicated that the percent recoveries for surrogates for soil ranged from 72% to 128% which are within the acceptance criteria for organic compounds for the laboratory.

B4.8 Holding Times

NEPC (1999), APHA 20th Edition and AS2031.1-1986 present recommended holding times for various analyses (under specified conditions, for example below 4°C in an airtight container), which must be met in order to consider the results valid. The holding times may vary slightly depending on the document referenced.

The standard holding times for the analysis undertaken for this investigation is set out in the table below.

Analyte	Matrix	Recommended Maximum Holding Time	Compliance
TRH	Soil	14 days	Y
BTEX	Soil	14 days	Y
PAHs	Soil	14 days	Y
Metals	Soil	6 months	Y
Mercury	Soil	28 days	Y

Review of the chain-of-custody documentation and the laboratory reports indicated that for the initial batches of analysis for soil, the holding times met the standard holding times set out in the table above for all analytes tested.

B5 Data Validation

The overall assessment of the quality of the data obtained during this investigation is discussed below in terms of the data quality indicators provided above.

Non-compliances have been documented and discussed in the report. The DQIs are as follows:

DQI	Description	Compliance
Precision	Precision is a quantitative measure of the variability (or reproducibility) of data.	Precision or variability of the data was assessed by determining RPDs between the original and duplicate samples analysed. Based on results discussed above, LG considers that the precision of the data is sufficient for the purposes of this investigation.

DQI	Description	Compliance
Accuracy	Accuracy is a quantitative measure of the closeness of reported data to the true value.	Accuracy of the data was mainly assessed through review of the laboratory QA/QC results. From the laboratory QA/QC results, LG considers that the accuracy of the data is sufficient for the purposes of this investigation.
Representativeness	Representativeness is the confidence (expressed qualitatively) that data are representative of each media present on the site.	Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of parameter variations at sampling points or environmental conditions. Sample representativeness is controlled through selecting sampling locations that exemplify site conditions and obtaining suitable samples from these sites. Sample selection and analysis was conducted in order to meet the specific objectives of the project. Analysis for the contaminants of concern was selectively conducted on samples collected as indicated in analytical tables. Based on the sampling and analytical regime undertaken by LG, the results obtained are considered to be sufficiently representative of the subsurface conditions at the locations tested.
Completeness	Completeness is a measure of the amount of usable data (expressed as %) from a data collection activity.	The completeness of data is defined as the percentage of analytical results that are considered valid. Valid chemical data are values that have been identified as acceptable or acceptable as qualified during the data validation process. The completeness is a comparison of the total number of samples accepted against the total number of samples, calculated as a percentage. The project goal for completeness is 95%. Completeness also includes checking that all entries in the data tables are correct, properly entered, and that any typographical errors are corrected and the data are re-entered properly, as required. Some of the samples collected and analysed did not comply with the stated DQIs. However, the data that did comply with the DQOs and DQIs, is considered to be sufficiently quantitative and complete for the purposes of this investigation (i.e. >95%)

DQI	Description	Compliance
Comparability	Comparability is the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.	Comparability expresses the confidence with which one data set can be compared with another. In order to assess comparability, field sampling procedures, laboratory sample preparation procedures, analytical procedures, and reporting units must be known and similar to established protocols, as was the case during this investigation. Qualitatively, data subjected to strict QA/QC procedures will be deemed more reliable, and therefore more comparable, than other data. Each analyte was analysed by the same analytical laboratory using identical methods, and laboratory EQLs were consistent over each laboratory batch. Additionally, a check laboratory was used to assess variability between laboratories. Based on the above, the data obtained throughout the investigation is considered to be suitably comparable.

LG notes that the deviations from standard data quality requirements are a result of the nature of the sampled materials and do not reflect adversely on the sampling methods adopted. Interpretation of the results should acknowledge potentially increased variability in the data and values close to guideline criteria should be treated with caution. No such results were identified in this assessment and LG considers that the laboratory data quality is acceptable for the identification and delineation of impact at the site.

Based on the assessment of field and laboratory QA/QC data, LG considers that the reported field and analytical results are of a quality that can be relied upon for the purposes of the investigation works.

Appendix C – Laboratory Reports

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Gonzalo Parra
Client	LAND AND GROUNDWATER CONSULTING PTY LTD
Address	131 B Riverview Road NSW 2204
Telephone	61 2 95598424
Facsimile	(Not specified)
Email	gparra@lgconsult.com.au
Project	**LG17100.01 Dillwynnia Grove, Heathcote**
Order Number	**LGC141106060**
Samples	28

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE173782 R0**
Date Received	14/12/2017
Date Reported	21/12/2017

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

A portion of the sample supplied has been sub-sampled for asbestos due to large sample volume according to SGS In-house procedures. We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied. SGS Environment, Health and Safety recommends supplying approximately 50-100g of sample in a separate container.

Sample #5: Asbestos found as approx 20x10x2mm cement sheet fragment.

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Akheeqar Beniameen
Chemist

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 18/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

VOC's in Soil [AN433] Tested: 18/12/2017 (continued)

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 18/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 15/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	**290**	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	**280**	**63**	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	**68**	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	**68**	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	**450**	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	**570**	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	**520**	<210	<210

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	<45
TRH C29-C36	mg/kg	45	<45
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 15/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	**0.1**	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	**0.1**	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	**0.1**	**0.1**	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	**0.1**	<0.1	**0.1**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	**0.1**	<0.1	**0.2**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	**0.2**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	**0.3**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	**0.3**	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	**1.3**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	**1.3**	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 15/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S3 SOIL - 14/12/2017 SE173782.010	S5 SOIL - 14/12/2017 SE173782.012
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015	S9 SOIL - 14/12/2017 SE173782.016	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	SH3 SOIL - 14/12/2017 SE173782.020	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	QC1A SOIL - 14/12/2017 SE173782.027
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1

OP Pesticides in Soil [AN420] Tested: 15/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S3 SOIL - 14/12/2017 SE173782.010	S5 SOIL - 14/12/2017 SE173782.012
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015	S9 SOIL - 14/12/2017 SE173782.016	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

OP Pesticides in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	SH3 SOIL - 14/12/2017 SE173782.020	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	QC1A SOIL - 14/12/2017 SE173782.027
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7

PCBs in Soil [AN420] Tested: 15/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S3 SOIL - 14/12/2017 SE173782.010	S5 SOIL - 14/12/2017 SE173782.012
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015	S9 SOIL - 14/12/2017 SE173782.016	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PCBs in Soil [AN420] Tested: 15/12/2017 (continued)

PARAMETER	UOM	LOR	SH3 SOIL - 14/12/2017 SE173782.020	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	QC1A SOIL - 14/12/2017 SE173782.027
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 19/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Arsenic, As	mg/kg	3	9	7	4	4	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	42	20	13	15	4.1
Copper, Cu	mg/kg	0.5	6.0	9.3	7.2	9.8	18
Lead, Pb	mg/kg	1	21	31	19	12	40
Nickel, Ni	mg/kg	0.5	3.5	5.1	2.5	8.0	2.5
Zinc, Zn	mg/kg	0.5	25	150	80	170	44

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
Arsenic, As	mg/kg	3	6	5	20	5	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.8	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	46	15	16	18	26
Copper, Cu	mg/kg	0.5	3.3	2.3	28	3.5	4.9
Lead, Pb	mg/kg	1	14	9	73	9	10
Nickel, Ni	mg/kg	0.5	2.1	1.7	8.3	2.5	1.5
Zinc, Zn	mg/kg	0.5	19	16	150	28	30

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
Arsenic, As	mg/kg	3	5	7	<3	3	5
Cadmium, Cd	mg/kg	0.3	<0.3	0.4	0.5	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	9.2	58	11	20	87
Copper, Cu	mg/kg	0.5	6.9	13	69	14	6.7
Lead, Pb	mg/kg	1	12	69	7	14	69
Nickel, Ni	mg/kg	0.5	2.9	2.8	220	13	3.8
Zinc, Zn	mg/kg	0.5	27	340	95	29	77

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
Arsenic, As	mg/kg	3	12	12	9	77	17
Cadmium, Cd	mg/kg	0.3	1.0	1.1	0.6	0.4	1.6
Chromium, Cr	mg/kg	0.3	110	81	85	21	160
Copper, Cu	mg/kg	0.5	26	35	23	58	51
Lead, Pb	mg/kg	1	230	350	230	82	680
Nickel, Ni	mg/kg	0.5	4.5	8.4	35	11	28
Zinc, Zn	mg/kg	0.5	490	510	440	830	460

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 19/12/2017

(continued)

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
Arsenic, As	mg/kg	3	<3	4	5	5	18
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	0.7
Chromium, Cr	mg/kg	0.3	76	5.2	8.0	9.2	15
Copper, Cu	mg/kg	0.5	19	3.3	3.9	4.3	28
Lead, Pb	mg/kg	1	10	8	5	7	63
Nickel, Ni	mg/kg	0.5	66	1.0	1.4	6.9	8.4
Zinc, Zn	mg/kg	0.5	44	26	41	30	180

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
Arsenic, As	mg/kg	3	6
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	37
Copper, Cu	mg/kg	0.5	6.9
Lead, Pb	mg/kg	1	66
Nickel, Ni	mg/kg	0.5	3.8
Zinc, Zn	mg/kg	0.5	120

Mercury in Soil [AN312] Tested: 19/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
Mercury	mg/kg	0.05	<0.05	<0.05	**0.10**	<0.05	<0.05

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
Mercury	mg/kg	0.05	<0.05	**0.07**	<0.05	<0.05	**0.09**

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
Mercury	mg/kg	0.05	**0.24**	**0.10**	**0.09**	**0.08**	**0.25**

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	**0.09**

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
Mercury	mg/kg	0.05	**0.08**

Moisture Content [AN002] Tested: 18/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
% Moisture	%w/w	0.5	34	8.3	15	11	5.3

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S2 SOIL - 14/12/2017 SE173782.009	S3 SOIL - 14/12/2017 SE173782.010
% Moisture	%w/w	0.5	7.8	3.3	11	2.4	5.1

PARAMETER	UOM	LOR	S4 SOIL - 14/12/2017 SE173782.011	S5 SOIL - 14/12/2017 SE173782.012	S6 SOIL - 14/12/2017 SE173782.013	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015
% Moisture	%w/w	0.5	5.5	12	3.6	4.0	12

PARAMETER	UOM	LOR	S9 SOIL - 14/12/2017 SE173782.016	S10 SOIL - 14/12/2017 SE173782.017	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019	SH3 SOIL - 14/12/2017 SE173782.020
% Moisture	%w/w	0.5	13	8.3	9.4	7.9	5.2

PARAMETER	UOM	LOR	SH4 SOIL - 14/12/2017 SE173782.021	BH10/0.2-0.3 SOIL - 14/12/2017 SE173782.024	BH11/0.2-0.3 SOIL - 14/12/2017 SE173782.025	BH12/0.2-0.3 SOIL - 14/12/2017 SE173782.026	QC1A SOIL - 14/12/2017 SE173782.027
% Moisture	%w/w	0.5	3.0	3.9	6.5	3.5	11

PARAMETER	UOM	LOR	QC2A SOIL - 14/12/2017 SE173782.028
% Moisture	%w/w	0.5	12

Fibre Identification in soil [AN602] Tested: 20/12/2017

PARAMETER	UOM	LOR	TP1/0.5-1.0 SOIL - 13/12/2017 SE173782.001	TP2/0.3-1.0 SOIL - 13/12/2017 SE173782.002	TP3/0.2-0.3 SOIL - 13/12/2017 SE173782.003	TP4/0.2-0.3 SOIL - 13/12/2017 SE173782.004	TP5/0.2-0.3 SOIL - 13/12/2017 SE173782.005
Asbestos Detected	No unit	-	No	No	No	No	Yes
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	**>0.01**

PARAMETER	UOM	LOR	TP6/0.2-0.3 SOIL - 13/12/2017 SE173782.006	TP7/0.2-0.3 SOIL - 13/12/2017 SE173782.007	S1 SOIL - 14/12/2017 SE173782.008	S3 SOIL - 14/12/2017 SE173782.010	S5 SOIL - 14/12/2017 SE173782.012
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	S7 SOIL - 14/12/2017 SE173782.014	S8 SOIL - 14/12/2017 SE173782.015	S9 SOIL - 14/12/2017 SE173782.016	SH1 SOIL - 14/12/2017 SE173782.018	SH2 SOIL - 14/12/2017 SE173782.019
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	SH3 SOIL - 14/12/2017 SE173782.020	SH4 SOIL - 14/12/2017 SE173782.021
Asbestos Detected	No unit	-	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01

Fibre ID in bulk materials [AN602] Tested: 21/12/2017

PARAMETER	UOM	LOR	PACM1 MATERIAL - 13/12/2017 SE173782.022	PACM2 MATERIAL - 14/12/2017 SE173782.023
Asbestos Detected	No unit	-	Yes	Yes

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client only. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law .

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Client	LAND AND GROUNDWATER CONSULTING PTY LTD
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Facsimile	(Not specified)
Email	gparra@lgconsult.com.au
Project	**LG17100.01 Dillwynnia Grove, Heathcote**
Order Number	**LGC141106060**
Samples	19

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
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SGS Reference	**SE173782 R0**
Date Received	14 Dec 2017
Date Reported	21 Dec 2017

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

A portion of the sample supplied has been sub-sampled for asbestos due to large sample volume according to SGS In-house procedures. We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied. SGS Environment, Health and Safety recommends supplying approximately 50-100g of sample in a separate container.

Sample #5: Asbestos found as approx 20x10x2mm cement sheet fragment.

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Akheeqar Beniameen
Chemist

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE173782.001	TP1/0.5-1.0	Soil	134g Sand, Soil, Rocks	13 Dec 2017	No Asbestos Found	<0.01
SE173782.002	TP2/0.3-1.0	Soil	198g Sand, Soil, Rocks, Plant matter	13 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.003	TP3/0.2-0.3	Soil	157g Sand, Soil, Rocks, Plant matter	13 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.004	TP4/0.2-0.3	Soil	141g Clay, Sand, Rocks	13 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.005	TP5/0.2-0.3	Soil	171g Sand, Rocks	13 Dec 2017	Amosite & Chrysotile Asbestos Found	>0.01
SE173782.006	TP6/0.2-0.3	Soil	194g Clay, Sand, Rocks	13 Dec 2017	No Asbestos Found	<0.01
SE173782.007	TP7/0.2-0.3	Soil	161g Sand, Soil, Plant matter	13 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.008	S1	Soil	153g Sand, Soil, Rocks	14 Dec 2017	No Asbestos Found	<0.01
SE173782.010	S3	Soil	138g Sand	14 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.012	S5	Soil	149g Sand, Soil, Rocks	14 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.014	S7	Soil	188g Clay, Sand, Rocks	14 Dec 2017	No Asbestos Found	<0.01
SE173782.015	S8	Soil	124g Sand, Soil, Rocks	14 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.016	S9	Soil	152g Sand, Soil, Rocks	14 Dec 2017	No Asbestos Found	<0.01
SE173782.018	SH1	Soil	152g Sand, Soil, Rocks	14 Dec 2017	No Asbestos Found	<0.01
SE173782.019	SH2	Soil	149g Sand, Soil	14 Dec 2017	No Asbestos Found	<0.01
SE173782.020	SH3	Soil	138g Clay, Soil, Plant matter	14 Dec 2017	No Asbestos Found Organic Fibres Detected	<0.01
SE173782.021	SH4	Soil	151g Sand, Soil, Rocks	14 Dec 2017	No Asbestos Found	<0.01

RESULTS

Fibre ID in bulk materials — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE173782.022	PACM1	Other	90 x 50 x 10mm cement sheet fragments	13 Dec 2017	Amosite & Chrysotile Asbestos Detected	
SE173782.023	PACM2	Other	80 x 20 x 4mm cement sheet fragments	14 Dec 2017	Amosite, Chrysotile & Crocidolite Asbestos Detected	

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service .
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client.

Where reported: 'Asbestos Detected': Asbestos detected by polarised light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarised light microscopy, including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarised light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos -containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

SE173782 R0

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Gonzalo Parra	Manager	Huong Crawford
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Project	**LG17100.01 Dillwynnia Grove, Heathcote**	SGS Reference	**SE173782 R0**
Order Number	**LGC141106060**	Date Received	14 Dec 2017
Samples	28	Date Reported	22 Dec 2017

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items
Matrix Spike	Mercury in Soil	1 item
	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	3 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	26 Soil, 2 Material
Date documentation received	14/12/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	10.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE173782 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre ID in bulk materials

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
PACM1	SE173782.022	LB139089	13 Dec 2017	14 Dec 2017	13 Dec 2018	21 Dec 2017	13 Dec 2018	21 Dec 2017
PACM2	SE173782.023	LB139089	14 Dec 2017	14 Dec 2017	14 Dec 2018	21 Dec 2017	14 Dec 2018	21 Dec 2017

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB139027	13 Dec 2017	14 Dec 2017	13 Dec 2018	20 Dec 2017	13 Dec 2018	21 Dec 2017
S1	SE173782.008	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
S3	SE173782.010	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
S5	SE173782.012	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
S7	SE173782.014	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
S8	SE173782.015	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
S9	SE173782.016	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
SH1	SE173782.018	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
SH2	SE173782.019	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
SH3	SE173782.020	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017
SH4	SE173782.021	LB139027	14 Dec 2017	14 Dec 2017	14 Dec 2018	20 Dec 2017	14 Dec 2018	21 Dec 2017

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138911	13 Dec 2017	14 Dec 2017	10 Jan 2018	19 Dec 2017	10 Jan 2018	21 Dec 2017
S1	SE173782.008	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S2	SE173782.009	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S3	SE173782.010	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S4	SE173782.011	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S5	SE173782.012	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S6	SE173782.013	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S7	SE173782.014	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S8	SE173782.015	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S9	SE173782.016	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
S10	SE173782.017	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
SH1	SE173782.018	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
SH2	SE173782.019	LB138911	14 Dec 2017	14 Dec 2017	11 Jan 2018	19 Dec 2017	11 Jan 2018	21 Dec 2017
SH3	SE173782.020	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017
SH4	SE173782.021	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017
BH10/0.2-0.3	SE173782.024	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB139009	14 Dec 2017	14 Dec 2017	11 Jan 2018	20 Dec 2017	11 Jan 2018	21 Dec 2017

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138848	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017

HOLDING TIME SUMMARY

SE173782 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content (continued)

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S1	SE173782.008	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S2	SE173782.009	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S3	SE173782.010	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S4	SE173782.011	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S5	SE173782.012	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S6	SE173782.013	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S7	SE173782.014	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S8	SE173782.015	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S9	SE173782.016	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
S10	SE173782.017	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
SH1	SE173782.018	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
SH2	SE173782.019	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
SH3	SE173782.020	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
SH4	SE173782.021	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
QC1A	SE173782.027	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
QC2A	SE173782.028	LB138848	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S1	SE173782.008	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S2	SE173782.009	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S3	SE173782.010	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S4	SE173782.011	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S5	SE173782.012	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S6	SE173782.013	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S7	SE173782.014	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S8	SE173782.015	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S9	SE173782.016	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S10	SE173782.017	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH1	SE173782.018	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH2	SE173782.019	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH3	SE173782.020	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH4	SE173782.021	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S1	SE173782.008	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S2	SE173782.009	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S3	SE173782.010	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017

HOLDING TIME SUMMARY

SE173782 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S4	SE173782.011	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S5	SE173782.012	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S6	SE173782.013	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S7	SE173782.014	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S8	SE173782.015	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S9	SE173782.016	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S10	SE173782.017	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH1	SE173782.018	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH2	SE173782.019	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH3	SE173782.020	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH4	SE173782.021	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S1	SE173782.008	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S2	SE173782.009	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S3	SE173782.010	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S4	SE173782.011	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S5	SE173782.012	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S6	SE173782.013	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S7	SE173782.014	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S8	SE173782.015	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S9	SE173782.016	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S10	SE173782.017	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH1	SE173782.018	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH2	SE173782.019	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH3	SE173782.020	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH4	SE173782.021	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S1	SE173782.008	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S2	SE173782.009	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S3	SE173782.010	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S4	SE173782.011	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S5	SE173782.012	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S6	SE173782.013	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017

HOLDING TIME SUMMARY

SE173782 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S7	SE173782.014	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S8	SE173782.015	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S9	SE173782.016	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
S10	SE173782.017	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH1	SE173782.018	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH2	SE173782.019	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH3	SE173782.020	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
SH4	SE173782.021	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	21 Dec 2017

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138922	13 Dec 2017	14 Dec 2017	11 Jun 2018	19 Dec 2017	11 Jun 2018	21 Dec 2017
S1	SE173782.008	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S2	SE173782.009	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S3	SE173782.010	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S4	SE173782.011	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S5	SE173782.012	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S6	SE173782.013	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S7	SE173782.014	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S8	SE173782.015	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S9	SE173782.016	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
S10	SE173782.017	LB138922	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
SH1	SE173782.018	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
SH2	SE173782.019	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
SH3	SE173782.020	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
SH4	SE173782.021	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
QC1A	SE173782.027	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017
QC2A	SE173782.028	LB138939	14 Dec 2017	14 Dec 2017	12 Jun 2018	19 Dec 2017	12 Jun 2018	21 Dec 2017

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138732	13 Dec 2017	14 Dec 2017	27 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S1	SE173782.008	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S2	SE173782.009	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S3	SE173782.010	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S4	SE173782.011	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S5	SE173782.012	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S6	SE173782.013	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S7	SE173782.014	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S8	SE173782.015	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
S9	SE173782.016	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017

HOLDING TIME SUMMARY

SE173782 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
S10	SE173782.017	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
SH1	SE173782.018	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
SH2	SE173782.019	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
SH3	SE173782.020	LB138732	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
SH4	SE173782.021	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
QC1A	SE173782.027	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017
QC2A	SE173782.028	LB138733	14 Dec 2017	14 Dec 2017	28 Dec 2017	15 Dec 2017	24 Jan 2018	20 Dec 2017

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S1	SE173782.008	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S2	SE173782.009	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S3	SE173782.010	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S4	SE173782.011	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S5	SE173782.012	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S6	SE173782.013	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S7	SE173782.014	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S8	SE173782.015	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S9	SE173782.016	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S10	SE173782.017	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH1	SE173782.018	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH2	SE173782.019	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH3	SE173782.020	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH4	SE173782.021	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1/0.5-1.0	SE173782.001	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP2/0.3-1.0	SE173782.002	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP3/0.2-0.3	SE173782.003	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP4/0.2-0.3	SE173782.004	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP5/0.2-0.3	SE173782.005	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP6/0.2-0.3	SE173782.006	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
TP7/0.2-0.3	SE173782.007	LB138842	13 Dec 2017	14 Dec 2017	27 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S1	SE173782.008	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S2	SE173782.009	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S3	SE173782.010	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S4	SE173782.011	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S5	SE173782.012	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S6	SE173782.013	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S7	SE173782.014	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S8	SE173782.015	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S9	SE173782.016	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
S10	SE173782.017	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH1	SE173782.018	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH2	SE173782.019	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Volatile Petroleum Hydrocarbons in Soil (continued) **Method: ME-(AU)-[ENV]AN433**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SH3	SE173782.020	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
SH4	SE173782.021	LB138842	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	20 Dec 2017
BH10/0.2-0.3	SE173782.024	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
BH11/0.2-0.3	SE173782.025	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
BH12/0.2-0.3	SE173782.026	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
QC1A	SE173782.027	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017
QC2A	SE173782.028	LB138845	14 Dec 2017	14 Dec 2017	28 Dec 2017	18 Dec 2017	27 Jan 2018	21 Dec 2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	105
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	103
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	98
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	101
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	99
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	97
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	97
	S1	SE173782.008	%	60 - 130%	101
	S3	SE173782.010	%	60 - 130%	91
	S5	SE173782.012	%	60 - 130%	93
	S7	SE173782.014	%	60 - 130%	98
	S8	SE173782.015	%	60 - 130%	106
	S9	SE173782.016	%	60 - 130%	98
	SH1	SE173782.018	%	60 - 130%	91
	SH2	SE173782.019	%	60 - 130%	97
	SH3	SE173782.020	%	60 - 130%	110
	SH4	SE173782.021	%	60 - 130%	108
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	110
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	102
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	106
	QC1A	SE173782.027	%	60 - 130%	109

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	98
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	92
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	94
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	94
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	92
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	90
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	92
	S1	SE173782.008	%	60 - 130%	92
	S3	SE173782.010	%	60 - 130%	96
	S5	SE173782.012	%	60 - 130%	86
	S7	SE173782.014	%	60 - 130%	88
	S8	SE173782.015	%	60 - 130%	92
	S9	SE173782.016	%	60 - 130%	92
	SH1	SE173782.018	%	60 - 130%	94
	SH2	SE173782.019	%	60 - 130%	94
	SH3	SE173782.020	%	60 - 130%	94
	SH4	SE173782.021	%	60 - 130%	94
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	92
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	100
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	96
	QC1A	SE173782.027	%	60 - 130%	94
d14-p-terphenyl (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	98
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	100
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	102
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	106
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	100
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	98
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	100
	S1	SE173782.008	%	60 - 130%	96
	S3	SE173782.010	%	60 - 130%	102
	S5	SE173782.012	%	60 - 130%	96
	S7	SE173782.014	%	60 - 130%	96
	S8	SE173782.015	%	60 - 130%	98
	S9	SE173782.016	%	60 - 130%	102
	SH1	SE173782.018	%	60 - 130%	104
	SH2	SE173782.019	%	60 - 130%	102
	SH3	SE173782.020	%	60 - 130%	102

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OP Pesticides in Soil (continued) — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	SH4	SE173782.021	%	60 - 130%	100
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	100
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	106
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	104
	QC1A	SE173782.027	%	60 - 130%	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	TP1/0.5-1.0	SE173782.001	%	70 - 130%	98
	TP2/0.3-1.0	SE173782.002	%	70 - 130%	92
	TP3/0.2-0.3	SE173782.003	%	70 - 130%	94
	TP4/0.2-0.3	SE173782.004	%	70 - 130%	94
	TP5/0.2-0.3	SE173782.005	%	70 - 130%	92
	TP6/0.2-0.3	SE173782.006	%	70 - 130%	90
	TP7/0.2-0.3	SE173782.007	%	70 - 130%	92
	S1	SE173782.008	%	70 - 130%	92
	S2	SE173782.009	%	70 - 130%	92
	S3	SE173782.010	%	70 - 130%	96
	S4	SE173782.011	%	70 - 130%	90
	S5	SE173782.012	%	70 - 130%	86
	S6	SE173782.013	%	70 - 130%	88
	S7	SE173782.014	%	70 - 130%	88
	S8	SE173782.015	%	70 - 130%	92
	S9	SE173782.016	%	70 - 130%	92
	S10	SE173782.017	%	70 - 130%	94
	SH1	SE173782.018	%	70 - 130%	94
	SH2	SE173782.019	%	70 - 130%	94
	SH3	SE173782.020	%	70 - 130%	94
	SH4	SE173782.021	%	70 - 130%	94
	BH10/0.2-0.3	SE173782.024	%	70 - 130%	92
	BH11/0.2-0.3	SE173782.025	%	70 - 130%	100
	BH12/0.2-0.3	SE173782.026	%	70 - 130%	96
	QC1A	SE173782.027	%	70 - 130%	94
	QC2A	SE173782.028	%	70 - 130%	96
d14-p-terphenyl (Surrogate)	TP1/0.5-1.0	SE173782.001	%	70 - 130%	98
	TP2/0.3-1.0	SE173782.002	%	70 - 130%	100
	TP3/0.2-0.3	SE173782.003	%	70 - 130%	102
	TP4/0.2-0.3	SE173782.004	%	70 - 130%	106
	TP5/0.2-0.3	SE173782.005	%	70 - 130%	100
	TP6/0.2-0.3	SE173782.006	%	70 - 130%	98
	TP7/0.2-0.3	SE173782.007	%	70 - 130%	100
	S1	SE173782.008	%	70 - 130%	96
	S2	SE173782.009	%	70 - 130%	100
	S3	SE173782.010	%	70 - 130%	102
	S4	SE173782.011	%	70 - 130%	94
	S5	SE173782.012	%	70 - 130%	96
	S6	SE173782.013	%	70 - 130%	96
	S7	SE173782.014	%	70 - 130%	96
	S8	SE173782.015	%	70 - 130%	98
	S9	SE173782.016	%	70 - 130%	102
	S10	SE173782.017	%	70 - 130%	100
	SH1	SE173782.018	%	70 - 130%	104
	SH2	SE173782.019	%	70 - 130%	102
	SH3	SE173782.020	%	70 - 130%	102
	SH4	SE173782.021	%	70 - 130%	100
	BH10/0.2-0.3	SE173782.024	%	70 - 130%	100
	BH11/0.2-0.3	SE173782.025	%	70 - 130%	106
	BH12/0.2-0.3	SE173782.026	%	70 - 130%	104
	QC1A	SE173782.027	%	70 - 130%	102
	QC2A	SE173782.028	%	70 - 130%	102
d5-nitrobenzene (Surrogate)	TP1/0.5-1.0	SE173782.001	%	70 - 130%	96

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued) — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d5-nitrobenzene (Surrogate)	TP2/0.3-1.0	SE173782.002	%	70 - 130%	88
	TP3/0.2-0.3	SE173782.003	%	70 - 130%	98
	TP4/0.2-0.3	SE173782.004	%	70 - 130%	108
	TP5/0.2-0.3	SE173782.005	%	70 - 130%	100
	TP6/0.2-0.3	SE173782.006	%	70 - 130%	100
	TP7/0.2-0.3	SE173782.007	%	70 - 130%	102
	S1	SE173782.008	%	70 - 130%	102
	S2	SE173782.009	%	70 - 130%	104
	S3	SE173782.010	%	70 - 130%	110
	S4	SE173782.011	%	70 - 130%	96
	S5	SE173782.012	%	70 - 130%	94
	S6	SE173782.013	%	70 - 130%	96
	S7	SE173782.014	%	70 - 130%	96
	S8	SE173782.015	%	70 - 130%	104
	S9	SE173782.016	%	70 - 130%	104
	S10	SE173782.017	%	70 - 130%	108
	SH1	SE173782.018	%	70 - 130%	108
	SH2	SE173782.019	%	70 - 130%	106
	SH3	SE173782.020	%	70 - 130%	110
	SH4	SE173782.021	%	70 - 130%	96
	BH10/0.2-0.3	SE173782.024	%	70 - 130%	96
	BH11/0.2-0.3	SE173782.025	%	70 - 130%	106
	BH12/0.2-0.3	SE173782.026	%	70 - 130%	104
	QC1A	SE173782.027	%	70 - 130%	100
	QC2A	SE173782.028	%	70 - 130%	104

PCBs in Soil — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	105
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	103
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	98
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	101
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	99
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	97
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	97
	S1	SE173782.008	%	60 - 130%	101
	S3	SE173782.010	%	60 - 130%	91
	S5	SE173782.012	%	60 - 130%	93
	S7	SE173782.014	%	60 - 130%	98
	S8	SE173782.015	%	60 - 130%	106
	S9	SE173782.016	%	60 - 130%	98
	SH1	SE173782.018	%	60 - 130%	91
	SH2	SE173782.019	%	60 - 130%	97
	SH3	SE173782.020	%	60 - 130%	110
	SH4	SE173782.021	%	60 - 130%	108
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	110
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	102
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	106
	QC1A	SE173782.027	%	60 - 130%	109

VOC's in Soil — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	72
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	76
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	82
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	76
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	90
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	86
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	72
	S1	SE173782.008	%	60 - 130%	75
	S2	SE173782.009	%	60 - 130%	76
	S3	SE173782.010	%	60 - 130%	76

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued) — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	S4	SE173782.011	%	60 - 130%	81
	S5	SE173782.012	%	60 - 130%	81
	S6	SE173782.013	%	60 - 130%	73
	S7	SE173782.014	%	60 - 130%	74
	S8	SE173782.015	%	60 - 130%	73
	S9	SE173782.016	%	60 - 130%	76
	S10	SE173782.017	%	60 - 130%	73
	SH1	SE173782.018	%	60 - 130%	85
	SH2	SE173782.019	%	60 - 130%	78
	SH3	SE173782.020	%	60 - 130%	84
	SH4	SE173782.021	%	60 - 130%	81
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	77
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	91
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	98
	QC1A	SE173782.027	%	60 - 130%	80
	QC2A	SE173782.028	%	60 - 130%	87
d4-1,2-dichloroethane (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	90
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	73
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	71
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	86
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	75
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	80
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	84
	S1	SE173782.008	%	60 - 130%	88
	S2	SE173782.009	%	60 - 130%	83
	S3	SE173782.010	%	60 - 130%	76
	S4	SE173782.011	%	60 - 130%	91
	S5	SE173782.012	%	60 - 130%	77
	S6	SE173782.013	%	60 - 130%	87
	S7	SE173782.014	%	60 - 130%	87
	S8	SE173782.015	%	60 - 130%	79
	S9	SE173782.016	%	60 - 130%	76
	S10	SE173782.017	%	60 - 130%	74
	SH1	SE173782.018	%	60 - 130%	83
	SH2	SE173782.019	%	60 - 130%	90
	SH3	SE173782.020	%	60 - 130%	93
	SH4	SE173782.021	%	60 - 130%	96
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	73
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	97
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	102
	QC1A	SE173782.027	%	60 - 130%	77
	QC2A	SE173782.028	%	60 - 130%	104
d8-toluene (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	78
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	71
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	72
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	74
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	77
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	74
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	77
	S1	SE173782.008	%	60 - 130%	74
	S2	SE173782.009	%	60 - 130%	83
	S3	SE173782.010	%	60 - 130%	78
	S4	SE173782.011	%	60 - 130%	83
	S5	SE173782.012	%	60 - 130%	79
	S6	SE173782.013	%	60 - 130%	74
	S7	SE173782.014	%	60 - 130%	87
	S8	SE173782.015	%	60 - 130%	75
	S9	SE173782.016	%	60 - 130%	75
	S10	SE173782.017	%	60 - 130%	74
	SH1	SE173782.018	%	60 - 130%	77
	SH2	SE173782.019	%	60 - 130%	72

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	SH3	SE173782.020	%	60 - 130%	77
	SH4	SE173782.021	%	60 - 130%	82
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	77
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	74
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	75
	QC1A	SE173782.027	%	60 - 130%	73
	QC2A	SE173782.028	%	60 - 130%	77
Dibromofluoromethane (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	75
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	77
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	70
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	95
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	76
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	84
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	71
	S1	SE173782.008	%	60 - 130%	82
	S2	SE173782.009	%	60 - 130%	84
	S3	SE173782.010	%	60 - 130%	86
	S4	SE173782.011	%	60 - 130%	81
	S5	SE173782.012	%	60 - 130%	77
	S6	SE173782.013	%	60 - 130%	91
	S7	SE173782.014	%	60 - 130%	74
	S8	SE173782.015	%	60 - 130%	84
	S9	SE173782.016	%	60 - 130%	85
	S10	SE173782.017	%	60 - 130%	75
	SH1	SE173782.018	%	60 - 130%	74
	SH2	SE173782.019	%	60 - 130%	73
	SH3	SE173782.020	%	60 - 130%	95
	SH4	SE173782.021	%	60 - 130%	83
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	81
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	88
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	86
	QC1A	SE173782.027	%	60 - 130%	77
	QC2A	SE173782.028	%	60 - 130%	90

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	72
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	76
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	82
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	76
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	90
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	86
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	72
	S1	SE173782.008	%	60 - 130%	75
	S2	SE173782.009	%	60 - 130%	76
	S3	SE173782.010	%	60 - 130%	76
	S4	SE173782.011	%	60 - 130%	81
	S5	SE173782.012	%	60 - 130%	81
	S6	SE173782.013	%	60 - 130%	73
	S7	SE173782.014	%	60 - 130%	74
	S8	SE173782.015	%	60 - 130%	73
	S9	SE173782.016	%	60 - 130%	76
	S10	SE173782.017	%	60 - 130%	73
	SH1	SE173782.018	%	60 - 130%	85
	SH2	SE173782.019	%	60 - 130%	78
	SH3	SE173782.020	%	60 - 130%	84
	SH4	SE173782.021	%	60 - 130%	81
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	77
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	91
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	98
	QC1A	SE173782.027	%	60 - 130%	80

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QC2A	SE173782.028	%	60 - 130%	87
d4-1,2-dichloroethane (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	90
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	73
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	71
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	86
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	75
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	80
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	84
	S1	SE173782.008	%	60 - 130%	88
	S2	SE173782.009	%	60 - 130%	83
	S3	SE173782.010	%	60 - 130%	76
	S4	SE173782.011	%	60 - 130%	91
	S5	SE173782.012	%	60 - 130%	77
	S6	SE173782.013	%	60 - 130%	87
	S7	SE173782.014	%	60 - 130%	87
	S8	SE173782.015	%	60 - 130%	79
	S9	SE173782.016	%	60 - 130%	76
	S10	SE173782.017	%	60 - 130%	74
	SH1	SE173782.018	%	60 - 130%	83
	SH2	SE173782.019	%	60 - 130%	90
	SH3	SE173782.020	%	60 - 130%	93
	SH4	SE173782.021	%	60 - 130%	96
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	73
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	97
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	102
	QC1A	SE173782.027	%	60 - 130%	77
	QC2A	SE173782.028	%	60 - 130%	104
d8-toluene (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	78
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	71
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	72
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	74
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	77
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	74
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	77
	S1	SE173782.008	%	60 - 130%	74
	S2	SE173782.009	%	60 - 130%	83
	S3	SE173782.010	%	60 - 130%	78
	S4	SE173782.011	%	60 - 130%	83
	S5	SE173782.012	%	60 - 130%	79
	S6	SE173782.013	%	60 - 130%	74
	S7	SE173782.014	%	60 - 130%	87
	S8	SE173782.015	%	60 - 130%	75
	S9	SE173782.016	%	60 - 130%	75
	S10	SE173782.017	%	60 - 130%	74
	SH1	SE173782.018	%	60 - 130%	77
	SH2	SE173782.019	%	60 - 130%	72
	SH3	SE173782.020	%	60 - 130%	77
	SH4	SE173782.021	%	60 - 130%	82
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	77
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	74
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	75
	QC1A	SE173782.027	%	60 - 130%	73
	QC2A	SE173782.028	%	60 - 130%	77
Dibromofluoromethane (Surrogate)	TP1/0.5-1.0	SE173782.001	%	60 - 130%	75
	TP2/0.3-1.0	SE173782.002	%	60 - 130%	77
	TP3/0.2-0.3	SE173782.003	%	60 - 130%	70
	TP4/0.2-0.3	SE173782.004	%	60 - 130%	95
	TP5/0.2-0.3	SE173782.005	%	60 - 130%	76
	TP6/0.2-0.3	SE173782.006	%	60 - 130%	84
	TP7/0.2-0.3	SE173782.007	%	60 - 130%	71
	S1	SE173782.008	%	60 - 130%	82

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	S2	SE173782.009	%	60 - 130%	84
	S3	SE173782.010	%	60 - 130%	86
	S4	SE173782.011	%	60 - 130%	81
	S5	SE173782.012	%	60 - 130%	77
	S6	SE173782.013	%	60 - 130%	91
	S7	SE173782.014	%	60 - 130%	74
	S8	SE173782.015	%	60 - 130%	84
	S9	SE173782.016	%	60 - 130%	85
	S10	SE173782.017	%	60 - 130%	75
	SH1	SE173782.018	%	60 - 130%	74
	SH2	SE173782.019	%	60 - 130%	73
	SH3	SE173782.020	%	60 - 130%	95
	SH4	SE173782.021	%	60 - 130%	83
	BH10/0.2-0.3	SE173782.024	%	60 - 130%	81
	BH11/0.2-0.3	SE173782.025	%	60 - 130%	88
	BH12/0.2-0.3	SE173782.026	%	60 - 130%	86
	QC1A	SE173782.027	%	60 - 130%	77
	QC2A	SE173782.028	%	60 - 130%	90

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB138911.001	Mercury	mg/kg	0.05	<0.05
LB139009.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138732.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93
LB138733.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB138732.001	Dichlorvos	mg/kg	0.5	<0.5
	Dimethoate	mg/kg	0.5	<0.5
	Diazinon (Dimpylate)	mg/kg	0.5	<0.5
	Fenitrothion	mg/kg	0.2	<0.2
	Malathion	mg/kg	0.2	<0.2

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138732.001		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	94
		d14-p-terphenyl (Surrogate)	%	-	100
LB138733.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	106
		d14-p-terphenyl (Surrogate)	%	-	112

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138732.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	104
		2-fluorobiphenyl (Surrogate)	%	-	94
		d14-p-terphenyl (Surrogate)	%	-	100
LB138733.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138733.001	Surrogates	d5-nitrobenzene (Surrogate)	%	-	116
		2-fluorobiphenyl (Surrogate)	%	-	106
		d14-p-terphenyl (Surrogate)	%	-	112

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138732.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93
LB138733.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB138922.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB138939.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB138732.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110
LB138733.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB138842.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	70
		d4-1,2-dichloroethane (Surrogate)	%	-	73
		d8-toluene (Surrogate)	%	-	78
		Bromofluorobenzene (Surrogate)	%	-	86
	Totals	Total BTEX	mg/kg	0.6	<0.6
LB138845.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	86
		d4-1,2-dichloroethane (Surrogate)	%	-	89
		d8-toluene (Surrogate)	%	-	84
		Bromofluorobenzene (Surrogate)	%	-	93
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB138842.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	70
		d4-1,2-dichloroethane (Surrogate)	%	-	73
		d8-toluene (Surrogate)	%	-	78
LB138845.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	86
		d4-1,2-dichloroethane (Surrogate)	%	-	89
		d8-toluene (Surrogate)	%	-	84

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138911.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE173782.019	LB138911.024	Mercury	mg/kg	0.05	0.08	0.10	85	15
SE173782.026	LB139009.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE173782.028	LB139009.017	Mercury	mg/kg	0.05	0.08	0.07	95	10

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.006	LB138848.011	% Moisture	%w/w	0.5	7.8	7.7	43	2
SE173782.016	LB138848.022	% Moisture	%w/w	0.5	13	12	38	6
SE173782.028	LB138848.033	% Moisture	%w/w	0.5	12	12	39	0

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138732.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	30	7
SE173782.020	LB138732.025		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.020	LB138732.025		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.15	30	7
SE173782.027	LB138733.018		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.14	30	19

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138732.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
SE173782.020	LB138732.025		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.020	LB138732.025		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138732.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.5	30	8
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
SE173782.020	LB138732.025		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.6	30	4
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.020	LB138732.025	Surrogates	d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
SE173792.011	LB138733.014		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0.1	135	0
			Pyrene	mg/kg	0.1	0.1	0.1	117	9
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	148	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	184	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	0.2	83	32
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	0.1	0.2	104	37
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.1	0.2	99	34
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	0.1	0.1	117	26
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	0.2	133	1
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	0.3	116	4
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	0.3	100	25
			Total PAH (18)	mg/kg	0.8	<0.8	0.9	149	13
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	4
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138732.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	7
SE173782.020	LB138732.025		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.008	LB138922.014	Arsenic, As	mg/kg	3	20	16	36	20
		Cadmium, Cd	mg/kg	0.3	0.8	0.7	73	15
		Chromium, Cr	mg/kg	0.3	16	14	33	14
		Copper, Cu	mg/kg	0.5	28	32	32	12
		Lead, Pb	mg/kg	1	73	58	32	24
		Nickel, Ni	mg/kg	0.5	8.3	7.5	36	9
		Zinc, Zn	mg/kg	0.5	150	290	31	64 ②
SE173782.017	LB138922.024	Arsenic, As	mg/kg	3	12	11	39	7

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.017	LB138922.024		Cadmium, Cd	mg/kg	0.3	1.1	1.0	59	5
			Chromium, Cr	mg/kg	0.3	81	100	31	25
			Copper, Cu	mg/kg	0.5	35	27	32	28
			Lead, Pb	mg/kg	1	350	250	30	33 ②
			Nickel, Ni	mg/kg	0.5	8.4	7.1	36	17
			Zinc, Zn	mg/kg	0.5	510	380	30	28
SE173782.028	LB138939.013		Arsenic, As	mg/kg	3	6	5	47	20
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	151	0
			Chromium, Cr	mg/kg	0.3	37	36	31	5
			Copper, Cu	mg/kg	0.5	6.9	7.3	37	6
			Lead, Pb	mg/kg	1	66	65	32	2
			Nickel, Ni	mg/kg	0.5	3.8	3.5	44	7
			Zinc, Zn	mg/kg	0.5	120	96	32	19

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138732.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE173782.020	LB138732.025		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE173792.011	LB138733.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138842.015	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	3.5	50	19
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.8	4.2	50	10
			d8-toluene (Surrogate)	mg/kg	-	3.9	4.0	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	3.7	50	4
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE173782.021	LB138842.030	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.021	LB138842.030	Monocyclic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.0	50	3
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	3.6	50	28
			d8-toluene (Surrogate)	mg/kg	-	4.1	5.2	50	23
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.1	3.9	50	5
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE173782.024	LB138845.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	3.8	50	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	4.2	50	13
			d8-toluene (Surrogate)	mg/kg	-	3.8	4.0	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.5	50	14
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE173792.014	LB138845.024	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	4.4	50	23
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.9	5.0	50	24
			d8-toluene (Surrogate)	mg/kg	-	3.7	4.0	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.2	4.9	50	16
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.010	LB138842.015		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	3.5	30	19
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.8	4.2	30	10
			d8-toluene (Surrogate)	mg/kg	-	3.9	4.0	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	3.7	30	4
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE173782.021	LB138842.030		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.0	30	3
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	3.6	30	28
			d8-toluene (Surrogate)	mg/kg	-	4.1	5.2	30	23
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.1	3.9	30	5
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE173782.024	LB138845.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	3.8	30	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	4.2	30	13
			d8-toluene (Surrogate)	mg/kg	-	3.8	4.0	30	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.5	30	14
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.024	LB138845.014	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE173792.014	LB138845.024		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	4.4	30	23
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.9	5.0	30	24
			d8-toluene (Surrogate)	mg/kg	-	3.7	4.0	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.2	4.9	30	16
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138911.002	Mercury	mg/kg	0.05	0.20	0.2	70 - 130	102
LB139009.002	Mercury	mg/kg	0.05	0.17	0.2	70 - 130	87

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138732.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	92
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	89
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	92
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	81
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	88
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	88
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	96
LB138733.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	112
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	97
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	107
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	101
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	105
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	104
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	101

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138732.002		Dichlorvos	mg/kg	0.5	2.0	2	60 - 140	99
		Diazinon (Dimpylate)	mg/kg	0.5	2.1	2	60 - 140	104
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.7	2	60 - 140	87
		Ethion	mg/kg	0.2	1.5	2	60 - 140	76
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
LB138733.002		Dichlorvos	mg/kg	0.5	2.5	2	60 - 140	123
		Diazinon (Dimpylate)	mg/kg	0.5	2.2	2	60 - 140	111
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.3	2	60 - 140	116
		Ethion	mg/kg	0.2	2.1	2	60 - 140	105
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138732.002		Naphthalene	mg/kg	0.1	3.8	4	60 - 140	94
		Acenaphthylene	mg/kg	0.1	3.9	4	60 - 140	96
		Acenaphthene	mg/kg	0.1	3.8	4	60 - 140	96
		Phenanthrene	mg/kg	0.1	3.8	4	60 - 140	95
		Anthracene	mg/kg	0.1	4.0	4	60 - 140	100
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	102
		Pyrene	mg/kg	0.1	3.9	4	60 - 140	97
		Benzo(a)pyrene	mg/kg	0.1	4.9	4	60 - 140	122
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
LB138733.002		Naphthalene	mg/kg	0.1	3.7	4	60 - 140	92
		Acenaphthylene	mg/kg	0.1	3.9	4	60 - 140	98
		Acenaphthene	mg/kg	0.1	3.7	4	60 - 140	91
		Phenanthrene	mg/kg	0.1	3.5	4	60 - 140	88
		Anthracene	mg/kg	0.1	3.7	4	60 - 140	94
		Fluoranthene	mg/kg	0.1	3.9	4	60 - 140	99
		Pyrene	mg/kg	0.1	3.6	4	60 - 140	90
		Benzo(a)pyrene	mg/kg	0.1	4.2	4	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138732.002	Arochlor 1260	mg/kg	0.2	0.3	0.4	60 - 140	85
LB138733.002	Arochlor 1260	mg/kg	0.2	0.3	0.4	60 - 140	85

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138922.002	Arsenic, As	mg/kg	3	51	50	80 - 120	101
	Cadmium, Cd	mg/kg	0.3	51	50	80 - 120	103
	Chromium, Cr	mg/kg	0.3	49	50	80 - 120	99
	Copper, Cu	mg/kg	0.5	50	50	80 - 120	99
	Lead, Pb	mg/kg	1	51	50	80 - 120	101
	Nickel, Ni	mg/kg	0.5	50	50	80 - 120	100
	Zinc, Zn	mg/kg	0.5	49	50	80 - 120	98
LB138939.002	Arsenic, As	mg/kg	3	51	50	80 - 120	102
	Cadmium, Cd	mg/kg	0.3	51	50	80 - 120	101
	Chromium, Cr	mg/kg	0.3	49	50	80 - 120	98
	Copper, Cu	mg/kg	0.5	51	50	80 - 120	101
	Lead, Pb	mg/kg	1	50	50	80 - 120	100
	Nickel, Ni	mg/kg	0.5	50	50	80 - 120	100
	Zinc, Zn	mg/kg	0.5	50	50	80 - 120	100

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138732.002		TRH C10-C14	mg/kg	20	35	40	60 - 140	88
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	88
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	70
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	35	40	60 - 140	88
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	78
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75
LB138733.002		TRH C10-C14	mg/kg	20	29	40	60 - 140	73
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	68
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	75
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	28	40	60 - 140	70
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	73
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138842.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	73
		Toluene	mg/kg	0.1	1.9	2.9	60 - 140	67
		Ethylbenzene	mg/kg	0.1	2.0	2.9	60 - 140	69
		m/p-xylene	mg/kg	0.2	4.5	5.8	60 - 140	77
		o-xylene	mg/kg	0.1	2.1	2.9	60 - 140	72
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	5	60 - 140	75
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.5	5	60 - 140	89
		d8-toluene (Surrogate)	mg/kg	-	3.6	5	60 - 140	71
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.2	5	60 - 140	84
LB138845.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	2.0	2.9	60 - 140	67
		Toluene	mg/kg	0.1	2.1	2.9	60 - 140	71
		Ethylbenzene	mg/kg	0.1	2.0	2.9	60 - 140	67
		m/p-xylene	mg/kg	0.2	4.2	5.8	60 - 140	72
		o-xylene	mg/kg	0.1	1.9	2.9	60 - 140	67
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	5	60 - 140	78
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	5	60 - 140	84
		d8-toluene (Surrogate)	mg/kg	-	4.1	5	60 - 140	82
		Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	5	60 - 140	75

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138842.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	87
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	86
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	5	60 - 140	75
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.5	5	60 - 140	89

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138842.002	Surrogates	d8-toluene (Surrogate)	mg/kg	-	3.6	5	60 - 140	71
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.2	5	60 - 140	84
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	124
LB138845.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	85
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	79
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	5	60 - 140	78
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	5	60 - 140	84
		d8-toluene (Surrogate)	mg/kg	-	4.1	5	60 - 140	82
		Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	5	60 - 140	75
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	124

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138911.004	Mercury	mg/kg	0.05	0.22	<0.05	0.2	95
SE173909.001	LB139009.004	Mercury	mg/kg	0.05	0.12	<0.01	0.2	56 ④

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138732.026		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	101
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	94
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	100
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	87
			Endrin	mg/kg	0.2	<0.2	<0.2	0.2	96
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	106
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.16	-	102

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138732.026		Dichlorvos	mg/kg	0.5	1.8	<0.5	2	91
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.1	<0.5	2	106
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.8	<0.2	2	91
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	1.6	<0.2	2	78
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	7.3	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138732.026	Naphthalene	mg/kg	0.1	3.7	<0.1	4	92
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	3.9	<0.1	4	97
		Acenaphthene	mg/kg	0.1	3.7	<0.1	4	92
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	3.7	<0.1	4	91

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138732.026		Anthracene	mg/kg	0.1	3.8	<0.1	4	96
			Fluoranthene	mg/kg	0.1	4.0	<0.1	4	100
			Pyrene	mg/kg	0.1	3.6	<0.1	4	91
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.4	<0.1	4	109
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.4	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.5	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.4	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	31	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	-	84
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	88
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	90
SE173782.024	LB138733.017		Naphthalene	mg/kg	0.1	3.8	<0.1	4	94
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	4.1	<0.1	4	103
			Acenaphthene	mg/kg	0.1	3.7	<0.1	4	94
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	3.7	<0.1	4	93
			Anthracene	mg/kg	0.1	4.0	<0.1	4	99
			Fluoranthene	mg/kg	0.1	4.1	<0.1	4	102
			Pyrene	mg/kg	0.1	3.9	<0.1	4	96
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.2	<0.1	4	104
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.2	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.3	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.2	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	31	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	104
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	96
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	102

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138732.026		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	105
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	117

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.018	LB138939.004	Arsenic, As	mg/kg	3	53	9	50	87
		Cadmium, Cd	mg/kg	0.3	45	0.6	50	88
		Chromium, Cr	mg/kg	0.3	99	85	50	29 ④
		Copper, Cu	mg/kg	0.5	70	23	50	94
		Lead, Pb	mg/kg	1	250	230	50	42 ④
		Nickel, Ni	mg/kg	0.5	75	35	50	80
		Zinc, Zn	mg/kg	0.5	430	440	50	-17 ④
SE173909.001	LB138922.004	Arsenic, As	mg/kg	3	58	1	50	113
		Cadmium, Cd	mg/kg	0.3	51	<0.1	50	102
		Chromium, Cr	mg/kg	0.3	60	8.2	50	103
		Copper, Cu	mg/kg	0.5	120	67	50	112
		Lead, Pb	mg/kg	1	53	3	50	100
		Nickel, Ni	mg/kg	0.5	52	2.1	50	99
		Zinc, Zn	mg/kg	0.5	100	49	50	107

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138732.026		TRH C10-C14	mg/kg	20	32	<20	40	80
			TRH C15-C28	mg/kg	45	<45	<45	40	78
			TRH C29-C36	mg/kg	45	<45	<45	40	70
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	32	<25	40	80
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	32	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	73
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-
SE173782.024	LB138733.017		TRH C10-C14	mg/kg	20	29	<20	40	73
			TRH C15-C28	mg/kg	45	<45	<45	40	75
			TRH C29-C36	mg/kg	45	<45	<45	40	80
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	30	<25	40	75
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	30	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	78
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173781.001	LB138845.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	1.9	0.01	2.9	64
			Toluene	mg/kg	0.1	2.0	0	2.9	69
			Ethylbenzene	mg/kg	0.1	1.7	0	2.9	60
			m/p-xylene	mg/kg	0.2	4.0	0.01	5.8	68
			o-xylene	mg/kg	0.1	2.0	0.01	2.9	68
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	0	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	4.28	-	79
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.9	4.58	-	78
			d8-toluene (Surrogate)	mg/kg	-	4.1	4.25	-	82
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	4.58	-	77
		Totals	Total Xylenes	mg/kg	0.3	5.9	0.02	-	-
			Total BTEX	mg/kg	0.6	12	0.03	-	-
SE173782.001	LB138842.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	2.2	<0.1	2.9	76
			Toluene	mg/kg	0.1	2.2	<0.1	2.9	74
			Ethylbenzene	mg/kg	0.1	2.0	<0.1	2.9	67
			m/p-xylene	mg/kg	0.2	4.5	<0.2	5.8	77
			o-xylene	mg/kg	0.1	2.1	<0.1	2.9	72
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	3.8	-	77
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	4.5	-	72
			d8-toluene (Surrogate)	mg/kg	-	4.1	3.9	-	81
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.3	3.6	-	85

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173782.001	LB138842.004	Totals	Total Xylenes	mg/kg	0.3	6.6	<0.3	-	-
			Total BTEX	mg/kg	0.6	13	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173781.001	LB138845.004		TRH C6-C10	mg/kg	25	<25	0.68	24.65	76
			TRH C6-C9	mg/kg	20	<20	0	23.2	73
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	4.28	-	79
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.9	4.58	-	78
			d8-toluene (Surrogate)	mg/kg	-	4.1	4.25	-	82
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	4.58	-	77
		VPH F	Benzene (F0)	mg/kg	0.1	1.9	0.01	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	0.65	7.25	101
SE173782.001	LB138842.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	82
			TRH C6-C9	mg/kg	20	21	<20	23.2	81
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	3.8	-	77
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	4.5	-	72
			d8-toluene (Surrogate)	mg/kg	-	4.1	3.9	-	81
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.3	3.6	-	85
		VPH F	Benzene (F0)	mg/kg	0.1	2.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	102

MATRIX SPIKE DUPLICATES

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

QC Sample	Sample Number	Parameter	Units	LOR

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

SAMPLE RECEIPT ADVICE

SE173782

CLIENT DETAILS

Contact	Gonzalo Parra
Client	LAND AND GROUNDWATER CONSULTING PTY LTD
Address	131 B Riverview Road NSW 2204
Telephone	61 2 95598424
Facsimile	(Not specified)
Email	gparra@lgconsult.com.au
Project	**LG17100.01 Dillwynnia Grove, Heathcote**
Order Number	**LGC141106060**
Samples	28

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 14/12/2017
Report Due	Thu 21/12/2017
SGS Reference	**SE173782**

SUBMISSION DETAILS

This is to confirm that 28 samples were received on Thursday 14/12/2017. Results are expected to be ready by COB Thursday 21/12/2017.
Please quote SGS reference SE173782 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	26 Soil, 2 Material
Date documentation received	14/12/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	10.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

QC1B has been forwarded to ALS.
11 soil samples have been placed on hold.

SAMPLE RECEIPT ADVICE

SE173782

CLIENT DETAILS

Client LAND AND GROUNDWATER CONSULTING PTY LTD

Project LG17100.01 Dillwynnia Grove, Heathcote

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	TP1/0.5-1.0	29	14	26	11	7	10	12	8
002	TP2/0.3-1.0	29	14	26	11	7	10	12	8
003	TP3/0.2-0.3	29	14	26	11	7	10	12	8
004	TP4/0.2-0.3	29	14	26	11	7	10	12	8
005	TP5/0.2-0.3	29	14	26	11	7	10	12	8
006	TP6/0.2-0.3	29	14	26	11	7	10	12	8
007	TP7/0.2-0.3	29	14	26	11	7	10	12	8
008	S1	29	14	26	11	7	10	12	8
009	S2	-	-	26	-	7	10	12	8
010	S3	29	14	26	11	7	10	12	8
011	S4	-	-	26	-	7	10	12	8
012	S5	29	14	26	11	7	10	12	8
013	S6	-	-	26	-	7	10	12	8
014	S7	29	14	26	11	7	10	12	8
015	S8	29	14	26	11	7	10	12	8
016	S9	29	14	26	11	7	10	12	8
017	S10	-	-	26	-	7	10	12	8
018	SH1	29	14	26	11	7	10	12	8
019	SH2	29	14	26	11	7	10	12	8
020	SH3	29	14	26	11	7	10	12	8
021	SH4	29	14	26	11	7	10	12	8
024	BH10/0.2-0.3	29	14	26	11	7	10	12	8

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE173782

CLIENT DETAILS

Client LAND AND GROUNDWATER CONSULTING PTY LTD

Project LG17100.01 Dillwynnia Grove, Heathcote

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	BH11/0.2-0.3	29	14	26	11	7	10	12	8
026	BH12/0.2-0.3	29	14	26	11	7	10	12	8
027	QC1A	29	14	26	11	7	10	12	8
028	QC2A	-	-	26	-	7	10	12	8

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE173782

CLIENT DETAILS

Client LAND AND GROUNDWATER CONSULTING PTY LTD

Project LG17100.01 Dillwynnia Grove, Heathcote

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre ID in bulk materials	Fibre Identification in soil	Mercury in Soil	Moisture Content
001	TP1/0.5-1.0	-	2	1	1
002	TP2/0.3-1.0	-	2	1	1
003	TP3/0.2-0.3	-	2	1	1
004	TP4/0.2-0.3	-	2	1	1
005	TP5/0.2-0.3	-	2	1	1
006	TP6/0.2-0.3	-	2	1	1
007	TP7/0.2-0.3	-	2	1	1
008	S1	-	2	1	1
009	S2	-	-	1	1
010	S3	-	2	1	1
011	S4	-	-	1	1
012	S5	-	2	1	1
013	S6	-	-	1	1
014	S7	-	2	1	1
015	S8	-	2	1	1
016	S9	-	2	1	1
017	S10	-	-	1	1
018	SH1	-	2	1	1
019	SH2	-	2	1	1
020	SH3	-	2	1	1
021	SH4	-	2	1	1
022	PACM1	1	-	-	-
023	PACM2	1	-	-	-
024	BH10/0.2-0.3	-	-	1	1

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE173782

CLIENT DETAILS

Client LAND AND GROUNDWATER CONSULTING PTY LTD

Project LG17100.01 Dillwynnia Grove, Heathcote

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	Moisture Content
025	BH11/0.2-0.3	1	1
026	BH12/0.2-0.3	1	1
027	QC1A	1	1
028	QC2A	1	1

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

Chain of Custody Record

Project No:	LG17100.01	Lab:	SGS
Project/Site:	1-21 Dillwynnia Grove, Heathcote, NSW	Lab Quote No:	LGC141106060
Sampled By:	Gonzalo Parra	Lab Batch No:	
Phone:	0415 726 951	Date Results Required:	Standard TAT
Page 1 of 2		Sample Disposal After:	
Number of Eskies: 2			

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE: Soil 0.1-0.2 L Glass jar, unpreserved	Soil - Plastic bag	Water 0.1-0.2 L Plastic, Filtered, HNO3	Water 0.5-1.0 L Amber glass, unpreserved	Water 40-50ml Glass, unpreserved	Water 0.25-1 L Plastic, unpreserved	Water 0.2-1.0L Plastic, sterile	ANALYSIS REQUIRED: CL 17: TRH/BTEX/PAH/OC/OP / PCB/8 Metals	CL 10: TRH/BTEX/PAH/ 8 Metals	Asbestos ID Soil	HOLD
1	TP1/0.5-1.0	13/12/17	Soil	1	1						X		X	
	TP1/1.5	13/12/17	Soil	1										Hold
2	TP2/0.3-1.0	13/12/17	Soil	1	1						X		X	
	TP2/1.0	13/12/17	Soil	1										Hold
3	TP3/0.2-0.3	13/12/17	Soil	1	1						X		X	
	TP3/0.5	13/12/17	Soil	1										Hold
4	TP4/0.2-0.3	13/12/17	Soil	1	1						X		X	
	TP4/0.5	13/12/17	Soil	1										Hold
5	TP5/0.2-0.3	13/12/17	Soil	1	1						X		X	
	TP5/1.5	13/12/17	Soil	1										Hold
6	TP6/0.2-0.3	13/12/17	Soil	1	1						X		X	
	TP6/0.5	13/12/17	Soil	1										Hold
7	TP7/0.2-0.3	13/12/17	Soil	1	1						X		X	
	TP7/0.5	13/12/17	Soil	1										Hold
8	S1	14/12/17	Soil	1	1						X		X	
9	S2	14/12/17	Soil	1								X		
10	S3	14/12/17	Soil	1	1						X		X	
11	S4	14/12/17	Soil	1								X		
12	S5	14/12/17	Soil	1	1						X		X	
13	S6	14/12/17	Soil	1								X		
14	S7	14/12/17	Soil	1	1						X		X	
15	S8	14/12/17	Soil	1	1						X		X	
16	S9	14/12/17	Soil	1	1						X		X	
17	S10	14/12/17	Soil	1								X		
18	SH1	14/12/17	Soil	1	1						X		X	
19	SH2	14/12/17	Soil	1	1						X		X	
20	SH3	14/12/17	Soil	1	1						X		X	
21	SH4	14/12/17	Soil	1	1						X		X	
22	PACM1	13/12/17	Soil		1								X	
23	PACM2	14/12/17	Soil		1								X	
			TOTALS	28	9									

SGS EHS Alexandria Laboratory

SE173782 COC

Received: 14 – Dec – 2017

Relinquished By:				Received By:			Custody Seals Intact Y N
Gonzalo Parra		14/12/17					Samples Received Chilled Y N
NAME	SIGNATURE	DATE		NAME	SIGNATURE	DATE 14/1	Method of Shipment

NOTES:

Land & Groundwater Consulting Pty Ltd ABN 65 162 117 928
13/80-84 Illawarra Road
Marrickville NSW 2204

web www.lgconsult.com.au
email
email gparra@lgconsult.com.au

Chain of Custody Record

Project No:	LG17100.01
Project/Site:	1-21 Dillwynnia Grove, Heathcote, NSW
Sampled By:	Gonzalo Parra
Phone:	0415 726 951
Page	2 of 2
Number of Eskies:	2

Lab:	SGS
Lab Quote No:	LGC141106060
Lab Batch No:	
Date Results Required:	Standard TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE							ANALYSIS REQUIRED									HOLD
				Soil		Water					CL 17: TRH/BTEX/PAH/OC/OP / PCB/8 Metals	CL 10: TRH/BTEX/PAH/ 8 Metals	Asbestos ID Soil	Asbestos Quantification						
				0.1-0.2 L Glass jar, unpreserved	- Plastic bag	0.1-0.2 L Plastic, Filtered, HNO3	0.5-1.0 L Amber glass, unpreserved	40-50ml Glass, unpreserved	0.25-1 L Plastic, unpreserved	0.2-1.0L Plastic, sterile									
24	BH10/0.2-0.3	14/12/17	Soil	1	1						X									
	BH10/1.5	14/12/17	Soil	1																Hold
25	BH11/0.2-0.3	14/12/17	Soil	1	1						X									
	BH11/1.5	14/12/17	Soil	1																Hold
26	BH12/0.2-0.3	14/12/17	Soil	1	1						X									
	BH12/1.5	14/12/17	Soil	1																Hold
27	QC1A	14/12/17	Soil	1							X									
28	QC2A	14/12/17	Soil	1								X								
	QC1B	14/12/17	Soil	1							X		Please send to ALS							
	QC2B	14/12/17	Soil	1																Hold
			TOTALS	10	3															

Relinquished By: Gonzalo Parra
NAME [redacted] SIGNATURE 14/12/17 DATE

Received By:
NAME SIGNATURE DATE 14/12/17

Custody Seals Intact Y N
Samples Received Chilled Y N
Method of Shipment

NOTES: Please send samples QC1B to ALS

Land & Groundwater Consulting Pty Ltd ABN 65 162 117 928
13/80-84 Illawarra Road
Marrickville NSW 2204

web www.lgconsult.com.au
email [redacted]
email gparra@lgconsult.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1732021**	Page	: 1 of 7
Client	: **LAND & GROUNDWATER CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: GONZALO PARRA	Contact	: Customer Services ES
Address	: 13/80-84 Illawarra Road Marrickville NSW 2204	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: LG17100.01	Date Samples Received	: 15-Dec-2017 13:00
Order number	: ----	Date Analysis Commenced	: 19-Dec-2017
C-O-C number	: ----	Issue Date	: 27-Dec-2017 16:03
Sampler	: GONZALO PARRA		
Site	: 1-21 Dillwynnia Grove, Heathcote, NSW		
Quote number	: SYBQ/408/15		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC1B	----	----	----	----
			Client sampling date / time	14-Dec-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1732021-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**10.8**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**16**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**16**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**27**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**64**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**9**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**152**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.1**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC1B	----	----	----	----
				Client sampling date / time	14-Dec-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1732021-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC1B	----	----	----	----
				Client sampling date / time	14-Dec-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1732021-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC1B	----	----	----	----
				Client sampling date / time	14-Dec-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1732021-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**107**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**90.9**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**91.3**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**80.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**89.7**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**58.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**88.6**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**92.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**89.6**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**118**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**114**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**102**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1732021**	Page	: 1 of 5
Client	: **LAND & GROUNDWATER CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: GONZALO PARRA	Telephone	: +61-2-8784 8555
Project	: LG17100.01	Date Samples Received	: 15-Dec-2017
Site	: 1-21 Dillwynnia Grove, Heathcote, NSW	Issue Date	: 27-Dec-2017
Sampler	: GONZALO PARRA	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
QC1B	**14-Dec-2017**	**----**	----	----	**19-Dec-2017**	28-Dec-2017	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	12-Jun-2018	✓	**20-Dec-2017**	12-Jun-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	11-Jan-2018	✓	**20-Dec-2017**	11-Jan-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**22-Dec-2017**	29-Jan-2018	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**22-Dec-2017**	29-Jan-2018	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**22-Dec-2017**	29-Jan-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
QC1B	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	29-Jan-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
QC1B	**14-Dec-2017**	**19-Dec-2017**	28-Dec-2017	✓	**19-Dec-2017**	28-Dec-2017	✓
Soil Glass Jar - Unpreserved (EP071)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	29-Jan-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
QC1B	**14-Dec-2017**	**19-Dec-2017**	28-Dec-2017	✓	**19-Dec-2017**	28-Dec-2017	✓
Soil Glass Jar - Unpreserved (EP071)							
QC1B	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	29-Jan-2018	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
QC1B	**14-Dec-2017**	**19-Dec-2017**	28-Dec-2017	✓	**19-Dec-2017**	28-Dec-2017	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1732021**	Page	: 1 of 10
Client	: **LAND & GROUNDWATER CONSULTING PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: GONZALO PARRA	Contact	: Customer Services ES
Address	: 13/80-84 Illawarra Road Marrickville NSW 2204	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: LG17100.01	Date Samples Received	: 15-Dec-2017
Order number	: ----	Date Analysis Commenced	: 19-Dec-2017
C-O-C number	: ----	Issue Date	: 27-Dec-2017
Sampler	: GONZALO PARRA		
Site	: 1-21 Dillwynnia Grove, Heathcote, NSW		
Quote number	: SYBQ/408/15		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1328475)									
ES1731937-020	Anonymous	EA055: Moisture Content	----	1	%	11.3	11.1	1.02	0% - 50%
ES1732042-007	Anonymous	EA055: Moisture Content	----	1	%	11.5	10.6	8.15	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1329678)									
ES1732021-001	QC1B	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	17	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	16	16	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	27	27	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	64	65	1.90	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	152	156	2.73	0% - 20%
ES1731808-039	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	6	5	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1329679)									
ES1732021-001	QC1B	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.00	No Limit
ES1731808-039	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1326863)									
EW1705287-008	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1732021-001	QC1B	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1326859)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1326859) - continued									
ES1732021-001	QC1B	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 1326859)									
ES1732021-001	QC1B	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 1326859) - continued									
ES1732021-001	QC1B	EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1326862)									
EW1705287-008	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1732021-001	QC1B	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1326862) - continued									
ES1732021-001	QC1B	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1326861)									
EW1705287-008	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1732021-001	QC1B	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1328055)									
EP1714084-006	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1732170-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1326861)									
EW1705287-008	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1732021-001	QC1B	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1328055)									
EP1714084-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1732170-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 1328055)									
EP1714084-006	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1732170-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1329678)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	101	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	98.8	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	95.5	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	101	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.0	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	106	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	113	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1329679)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.3	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1326863)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	90.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 1326859)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	82.7	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	76.8	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	79.8	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	80.4	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.8	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	85.0	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	79.2	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	77.6	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.0	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	77.2	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	79.6	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	99.2	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	73.7	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	61.2	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1326859)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1326859) - continued								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	77.7	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.7	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	80.3	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	83.4	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	75.1	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	77.9	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	99.8	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	76.7	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	79.1	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	98.1	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	82.8	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	76.8	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.2	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	77.9	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	78.6	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	74.4	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.4	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	80.3	41	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1326862)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	114	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	114	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	112	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	119	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	110	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	114	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	116	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	117	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	108	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	112	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	108	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	108	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	114	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	105	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	106	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	109	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1326861)								
EP071: C10 - C14 Fraction		50	mg/kg	<50	200 mg/kg	102	75	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1326861) - continued								
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	98.2	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	106	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1328055)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	111	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1326861)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	105	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	107	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	99.5	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1328055)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	113	68	128
EP080: BTEXN (QCLot: 1328055)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	111	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	107	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.7	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	104	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	102	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 1329678)							
ES1731808-039	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.2	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.5	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.6	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	96.0	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	98.8	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.1	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1329679)							
ES1731808-039	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.2	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1326863)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1326863) - continued							
ES1732021-001	QC1B	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	100.0	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1326859)							
ES1732021-001	QC1B	EP068: gamma-BHC	58-89-9	0.5 mg/kg	97.5	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	89.3	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	107	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	83.4	70	130
		EP068: Endrin	72-20-8	2 mg/kg	104	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	74.6	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1326859)							
ES1732021-001	QC1B	EP068: Diazinon	333-41-5	0.5 mg/kg	88.2	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	77.9	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	110	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	82.8	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	89.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1326862)							
ES1732021-001	QC1B	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	112	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	121	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1326861)							
ES1732021-001	QC1B	EP071: C10 - C14 Fraction	----	523 mg/kg	91.3	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	108	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	121	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1328055)							
EP1714084-006	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	129	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1326861)							
ES1732021-001	QC1B	EP071: >C10 - C16 Fraction	----	860 mg/kg	106	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	114	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	104	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1328055)							
EP1714084-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	125	70	130
EP080: BTEXN (QCLot: 1328055)							
EP1714084-006	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	106	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	105	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	108	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	107	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	108	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 1328055) - continued							
EP1714084-006	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	94.2	70	130

Chain of Custody Record

Project No:	LG17100.01
Project/Site:	1-21 Dillwynnia Grove, Heathcote, NSW
Sampled By:	Gonzalo Parra
Phone:	0415 726 951
Page	2 of 2
Number of Eskies:	2

Lab:	SGS
Lab Quote No:	LGC141106060
Lab Batch No:	
Date Results Required:	Standard TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE							ANALYSIS REQUIRED									HOLD
				Soil		Water					CL 17: TRH/BTEX/PAH/OC/OP / PCB/8 Metals	CL 10: TRH/BTEX/PAH/ 8 Metals	Asbestos ID Soil	Asbestos Quantification						
				0.1-0.2 L Glass jar, unpreserved	- Plastic bag	0.1-0.2 L Plastic, Filtered, HNO3	0.5-1.0 L Amber glass, unpreserved	40-50ml Glass, unpreserved	0.25-1 L Plastic, unpreserved	0.2-1.0L Plastic, sterile									
	BH10/0.2-0.3	14/12/17	Soil	1	1						X									
	BH10/1.5	14/12/17	Soil	1																Hold
	BH11/0.2-0.3	14/12/17	Soil	1	1						X									
	BH11/1.5	14/12/17	Soil	1																Hold
	BH12/0.2-0.3	14/12/17	Soil	1	1						X									
	BH12/1.5	14/12/17	Soil	1																Hold
	QC1A	14/12/17	Soil	1							X									
	QC2A	14/12/17	Soil	1								X								
	QC1B	14/12/17	Soil	1							X		Please send to ALS							
	QC2B	14/12/17	Soil	1																Hold
			TOTALS	10	3															

Environmental Division Sydney
Work Order Reference
ES1732021

Telephone : +61-2-8784 8555

Relinquished By:			Received By:			Custody Seals Intact: Y N (N/A)
Gonzalo Parra		14/12/17	MGould	MGould	15-12-17	Samples Received Chilled: (Y) N
NAME	SIGNATURE	DATE	NAME	SIGNATURE	13:00 DATE	Method of Shipment: 15-90

NOTES: Please send samples QC1B to ALS

Land & Groundwater Consulting Pty Ltd ABN 65 162 117 928
13/80-84 Illawarra Road
Marrickville NSW 2204

web www.lgconsult.com.au
email
email gparra@lgconsult.com.au

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Gonzalo Parra
Client	LAND AND GROUNDWATER CONSULTING PTY LTD
Address	131 B Riverview Road NSW 2204
Telephone	61 2 95598424
Facsimile	(Not specified)
Email	gparra@lgconsult.com.au
Project	**LG17100.01 Dillwynnia Grove, Heathcote**
Order Number	**LGC141106060**
Samples	3

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
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Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE173824 R0**
Date Received	15/12/2017
Date Reported	21/12/2017

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

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Chemist

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Metals/Inorganics Team Leader

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Senior Chemist

Ly Kim Ha
Organic Section Head

Teresa Nguyen
Organic Chemist

VOC's in Soil [AN433] Tested: 19/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 19/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 16/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	**60**
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	**91**
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 16/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	**0.1**
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	**0.1**
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	**0.1**
Pyrene	mg/kg	0.1	<0.1	<0.1	**0.2**
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	**0.2**
Chrysene	mg/kg	0.1	<0.1	<0.1	**0.1**
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	**0.1**
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	**0.1**
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	**0.2**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	**0.1**
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	**0.1**
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	**0.2**
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	**0.3**
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	**0.3**
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	**1.5**
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	**1.5**

OC Pesticides in Soil [AN420] Tested: 16/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1

OP Pesticides in Soil [AN420] Tested: 16/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 16/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 19/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Arsenic, As	mg/kg	3	7	4	10
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.4
Chromium, Cr	mg/kg	0.3	28	2.0	47
Copper, Cu	mg/kg	0.5	12	160	31
Lead, Pb	mg/kg	1	13	4	50
Nickel, Ni	mg/kg	0.5	3.4	3.7	10
Zinc, Zn	mg/kg	0.5	97	24	100

Mercury in Soil [AN312] Tested: 19/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
Mercury	mg/kg	0.05	<0.05	<0.05	**0.06**

Moisture Content [AN002] Tested: 18/12/2017

PARAMETER	UOM	LOR	BH7/0.2-0.3 SOIL - 15/12/2017 SE173824.001	BH8/0.2-0.3 SOIL - 15/12/2017 SE173824.002	BH9/0.2-0.3 SOIL - 15/12/2017 SE173824.003
% Moisture	%w/w	0.5	**6.0**	**1.8**	**19**

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid , mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser . Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS /ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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STATEMENT OF QA/QC PERFORMANCE

SE173824 R0

CLIENT DETAILS

Contact	Gonzalo Parra
Client	LAND AND GROUNDWATER CONSULTING PTY LTD
Address	131 B Riverview Road NSW 2204
Telephone	61 2 95598424
Facsimile	(Not specified)
Email	gparra@lgconsult.com.au
Project	**LG17100.01 Dillwynnia Grove, Heathcote**
Order Number	**LGC141106060**
Samples	3

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE173824 R0**
Date Received	15 Dec 2017
Date Reported	27 Dec 2017

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	3 Soil
Date documentation received	15/12/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	7.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE173824 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138910	15 Dec 2017	15 Dec 2017	12 Jan 2018	19 Dec 2017	12 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138910	15 Dec 2017	15 Dec 2017	12 Jan 2018	19 Dec 2017	12 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138910	15 Dec 2017	15 Dec 2017	12 Jan 2018	19 Dec 2017	12 Jan 2018	21 Dec 2017

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138848	15 Dec 2017	15 Dec 2017	29 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138848	15 Dec 2017	15 Dec 2017	29 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138848	15 Dec 2017	15 Dec 2017	29 Dec 2017	18 Dec 2017	23 Dec 2017	20 Dec 2017

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138917	15 Dec 2017	15 Dec 2017	13 Jun 2018	19 Dec 2017	13 Jun 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138917	15 Dec 2017	15 Dec 2017	13 Jun 2018	19 Dec 2017	13 Jun 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138917	15 Dec 2017	15 Dec 2017	13 Jun 2018	19 Dec 2017	13 Jun 2018	21 Dec 2017

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138748	15 Dec 2017	15 Dec 2017	29 Dec 2017	16 Dec 2017	25 Jan 2018	21 Dec 2017

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138871	15 Dec 2017	15 Dec 2017	29 Dec 2017	19 Dec 2017	28 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138871	15 Dec 2017	15 Dec 2017	29 Dec 2017	19 Dec 2017	28 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138871	15 Dec 2017	15 Dec 2017	29 Dec 2017	19 Dec 2017	28 Jan 2018	21 Dec 2017

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH7/0.2-0.3	SE173824.001	LB138871	15 Dec 2017	15 Dec 2017	29 Dec 2017	19 Dec 2017	28 Jan 2018	21 Dec 2017
BH8/0.2-0.3	SE173824.002	LB138871	15 Dec 2017	15 Dec 2017	29 Dec 2017	19 Dec 2017	28 Jan 2018	21 Dec 2017
BH9/0.2-0.3	SE173824.003	LB138871	15 Dec 2017	15 Dec 2017	29 Dec 2017	19 Dec 2017	28 Jan 2018	21 Dec 2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	100
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	92
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	96

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	84
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	90
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	82
d14-p-terphenyl (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	86
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	90
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	84

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH7/0.2-0.3	SE173824.001	%	70 - 130%	84
	BH8/0.2-0.3	SE173824.002	%	70 - 130%	90
	BH9/0.2-0.3	SE173824.003	%	70 - 130%	82
d14-p-terphenyl (Surrogate)	BH7/0.2-0.3	SE173824.001	%	70 - 130%	86
	BH8/0.2-0.3	SE173824.002	%	70 - 130%	90
	BH9/0.2-0.3	SE173824.003	%	70 - 130%	84
d5-nitrobenzene (Surrogate)	BH7/0.2-0.3	SE173824.001	%	70 - 130%	78
	BH8/0.2-0.3	SE173824.002	%	70 - 130%	82
	BH9/0.2-0.3	SE173824.003	%	70 - 130%	74

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	100
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	92
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	96

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	77
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	77
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	75
d4-1,2-dichloroethane (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	91
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	76
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	94
d8-toluene (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	80
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	78
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	74
Dibromofluoromethane (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	81
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	79
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	85

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	77
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	77
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	75
d4-1,2-dichloroethane (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	91
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	76
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	94
d8-toluene (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	80
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	78
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	74
Dibromofluoromethane (Surrogate)	BH7/0.2-0.3	SE173824.001	%	60 - 130%	81
	BH8/0.2-0.3	SE173824.002	%	60 - 130%	79
	BH9/0.2-0.3	SE173824.003	%	60 - 130%	85

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB138910.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138748.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	94

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138748.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	76
		d14-p-terphenyl (Surrogate)	%	-	82

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB138748.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138748.001		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	76
		2-fluorobiphenyl (Surrogate)	%	-	76
		d14-p-terphenyl (Surrogate)	%	-	82

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB138748.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	94

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number		Parameter	Units	LOR	Result
LB138917.001		Arsenic, As	mg/kg	3	<3
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.3	<0.3
		Copper, Cu	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Nickel, Ni	mg/kg	0.5	<0.5
		Zinc, Zn	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result
LB138748.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB138871.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	71
		d4-1,2-dichloroethane (Surrogate)	%	-	81
		d8-toluene (Surrogate)	%	-	72
		Bromofluorobenzene (Surrogate)	%	-	70
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB138871.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	71
		d4-1,2-dichloroethane (Surrogate)	%	-	81
		d8-toluene (Surrogate)	%	-	72

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173778.001	LB138910.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE173806.041	LB138910.014	Mercury	mg/kg	0.05	0.19	0.27	51	35

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173782.006	LB138848.011	% Moisture	%w/w	0.5	7.8	7.7	43	2
SE173782.016	LB138848.022	% Moisture	%w/w	0.5	13	12	38	6
SE173782.028	LB138848.033	% Moisture	%w/w	0.5	12	12	39	0

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.035	LB138748.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	5
SE173824.002	LB138748.033		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173824.002	LB138748.033		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	30	9

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.035	LB138748.014		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
SE173824.002	LB138748.033		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	5

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.035	LB138748.014	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
		Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.035	LB138748.014		Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
SE173824.002	LB138748.033		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	5
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	5

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.035	LB138748.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	5
SE173824.002	LB138748.033		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	9

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate		Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.040	LB138917.014	Arsenic, As	mg/kg	3	4	9	46	80 ②
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	14	17	33	22
		Copper, Cu	mg/kg	0.5	8.8	21	33	82 ②
		Lead, Pb	mg/kg	1	10	62	33	143 ②
		Nickel, Ni	mg/kg	0.5	4.2	6.0	40	34
		Zinc, Zn	mg/kg	0.5	12	48	37	118 ②
SE173824.003	LB138917.024	Arsenic, As	mg/kg	3	10	13	39	24
		Cadmium, Cd	mg/kg	0.3	0.4	0.3	116	5
		Chromium, Cr	mg/kg	0.3	47	51	31	8
		Copper, Cu	mg/kg	0.5	31	24	32	25
		Lead, Pb	mg/kg	1	50	43	32	14
		Nickel, Ni	mg/kg	0.5	10	12	34	15
		Zinc, Zn	mg/kg	0.5	100	85	32	19

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173806.035	LB138748.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE173824.002	LB138748.033		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173840.003	LB138871.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	0	0	200	0
			Toluene	mg/kg	0.1	0	0	200	0
			Ethylbenzene	mg/kg	0.1	0	0	200	0
			m/p-xylene	mg/kg	0.2	0.02	0.01	200	0
			o-xylene	mg/kg	0.1	0.01	0.01	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	0	0.01	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.51	3.97	50	12
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.93	3.94	50	22
			d8-toluene (Surrogate)	mg/kg	-	5.32	4.72	50	12
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.08	3.9	50	5
		Totals	Total Xylenes	mg/kg	0.3	0.03	0.02	200	0
			Total BTEX	mg/kg	0.6	0.03	0.02	200	0
SE173881.003	LB138871.021	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	3.9	50	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	3.7	50	14
			d8-toluene (Surrogate)	mg/kg	-	3.7	3.5	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.7	50	3

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173881.003	LB138871.021	Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE173840.003	LB138871.014		TRH C6-C10	mg/kg	25	1.31	7.07	200	0
			TRH C6-C9	mg/kg	20	0.17	7.65	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.51	3.97	30	12
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.93	3.94	30	22
			d8-toluene (Surrogate)	mg/kg	-	5.32	4.72	30	12
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.08	3.9	30	5
		VPH F Bands	Benzene (F0)	mg/kg	0.1	0	0	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	1.28	7.05	200	0
SE173881.003	LB138871.021		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.7	3.9	30	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	3.7	30	14
			d8-toluene (Surrogate)	mg/kg	-	3.7	3.5	30	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.7	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138910.002	Mercury	mg/kg	0.05	0.20	0.2	70 - 130	99

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138748.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	99
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	104
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	94
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	94
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	112
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	121
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	90

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138748.002		Dichlorvos	mg/kg	0.5	2.1	2	60 - 140	103
		Diazinon (Dimpylate)	mg/kg	0.5	1.8	2	60 - 140	88
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.8	2	60 - 140	92
		Ethion	mg/kg	0.2	1.6	2	60 - 140	79
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138748.002		Naphthalene	mg/kg	0.1	3.4	4	60 - 140	86
		Acenaphthylene	mg/kg	0.1	3.3	4	60 - 140	83
		Acenaphthene	mg/kg	0.1	3.4	4	60 - 140	84
		Phenanthrene	mg/kg	0.1	3.4	4	60 - 140	85
		Anthracene	mg/kg	0.1	3.4	4	60 - 140	85
		Fluoranthene	mg/kg	0.1	3.4	4	60 - 140	84
		Pyrene	mg/kg	0.1	3.3	4	60 - 140	83
		Benzo(a)pyrene	mg/kg	0.1	3.5	4	60 - 140	87
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	76
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138748.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	101

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138917.002	Arsenic, As	mg/kg	3	50	50	80 - 120	100
	Cadmium, Cd	mg/kg	0.3	50	50	80 - 120	100
	Chromium, Cr	mg/kg	0.3	49	50	80 - 120	97
	Copper, Cu	mg/kg	0.5	50	50	80 - 120	100
	Lead, Pb	mg/kg	1	50	50	80 - 120	99
	Nickel, Ni	mg/kg	0.5	50	50	80 - 120	99
	Zinc, Zn	mg/kg	0.5	50	50	80 - 120	99

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138748.002		TRH C10-C14	mg/kg	20	35	40	60 - 140	88
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	85
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	75
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	35	40	60 - 140	88
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138871.002	Monocyclic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	71
	Aromatic	Toluene	mg/kg	0.1	2.3	2.9	60 - 140	79
		Ethylbenzene	mg/kg	0.1	1.9	2.9	60 - 140	66
		m/p-xylene	mg/kg	0.2	4.0	5.8	60 - 140	69
		o-xylene	mg/kg	0.1	1.9	2.9	60 - 140	65
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	5	60 - 140	81
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	86
		d8-toluene (Surrogate)	mg/kg	-	4.6	5	60 - 140	93
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	5	60 - 140	96

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB138871.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	87
		TRH C6-C9	mg/kg	20	21	23.2	60 - 140	91
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	5	60 - 140	81
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	86
		d8-toluene (Surrogate)	mg/kg	-	4.6	5	60 - 140	93
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	5	60 - 140	96
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	126

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.030	LB138910.004	Mercury	mg/kg	0.05	0.27	0.13	0.2	71

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.027	LB138748.032		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	96
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	101
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	90
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	92
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	101
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	113
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	-	99

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.027	LB138748.032		Dichlorvos	mg/kg	0.5	1.9	<0.5	2	96
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	1.7	<0.5	2	84
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.7	<0.2	2	85
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	1.6	<0.2	2	80
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	6.9	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	82
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	82

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.027	LB138748.032	Naphthalene	mg/kg	0.1	3.4	<0.1	4	85
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	3.3	<0.1	4	82
		Acenaphthene	mg/kg	0.1	3.4	<0.1	4	85
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	3.3	<0.1	4	83

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.027	LB138748.032		Anthracene	mg/kg	0.1	3.3	<0.1	4	84
			Fluoranthene	mg/kg	0.1	3.3	<0.1	4	82
			Pyrene	mg/kg	0.1	3.1	<0.1	4	76
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	3.5	<0.1	4	86
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	3.5	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	3.6	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	3.5	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	27	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	-	76
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	82
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	82

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.027	LB138748.032		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	104
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	109

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.029	LB138917.004	Arsenic, As	mg/kg	3	54	6	50	96
		Cadmium, Cd	mg/kg	0.3	50	<0.3	50	100
		Chromium, Cr	mg/kg	0.3	57	8.6	50	97
		Copper, Cu	mg/kg	0.5	60	11	50	98
		Lead, Pb	mg/kg	1	59	12	50	95
		Nickel, Ni	mg/kg	0.5	50	0.7	50	98
		Zinc, Zn	mg/kg	0.5	55	5.4	50	99

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE173806.027	LB138748.032		TRH C10-C14	mg/kg	20	43	<20	40	108
			TRH C15-C28	mg/kg	45	<45	<45	40	100
			TRH C29-C36	mg/kg	45	<45	<45	40	93
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	42	<25	40	105
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	42	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	98
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

MATRIX SPIKE DUPLICATES

SE173824 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

SAMPLE RECEIPT ADVICE

SE173824

CLIENT DETAILS

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Project	**LG17100.01 Dillwynnia Grove, Heathcote**
Order Number	**LGC141106060**
Samples	3

LABORATORY DETAILS

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Samples Received	Fri 15/12/2017
Report Due	Thu 21/12/2017
SGS Reference	**SE173824**

SUBMISSION DETAILS

This is to confirm that 3 samples were received on Friday 15/12/2017. Results are expected to be ready by COB Thursday 21/12/2017. Please quote SGS reference SE173824 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	3 Soil
Date documentation received	15/12/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	7.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

3 soil samples have been placed on hold.

SAMPLE RECEIPT ADVICE

SE173824

CLIENT DETAILS

Client LAND AND GROUNDWATER CONSULTING PTY LTD

Project LG17100.01 Dillwynnia Grove, Heathcote

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH7/0.2-0.3	29	14	26	11	7	10	12	8
002	BH8/0.2-0.3	29	14	26	11	7	10	12	8
003	BH9/0.2-0.3	29	14	26	11	7	10	12	8

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE173824

CLIENT DETAILS

Client LAND AND GROUNDWATER CONSULTING PTY LTD

Project LG17100.01 Dillwynnia Grove, Heathcote

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	Moisture Content
001	BH7/0.2-0.3	1	1
002	BH8/0.2-0.3	1	1
003	BH9/0.2-0.3	1	1

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

Chain of Custody Record

Project No:	LG17100.01	Lab:	SGS
Project/Site:	1-21 Dillwynnia Grove, Heathcote, NSW	Lab Quote No:	LGC141106060
Sampled By:	Gonzalo Parra	Lab Batch No:	
Phone:	0415 726 951	Date Results Required:	4 Days TAT - By 21/12/17
Page 1 of 1		Sample Disposal After:	
Number of Eskies: 1			

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE							ANALYSIS REQUIRED									HOLD
				Soil		Water					CL 17: TRH/BTEX/PAH/OC/OP / PCB/8 Metals									
				0.1-0.2 L Glass jar, unpreserved	- Plastic bag	0.1-0.2 L Plastic, Filtered, HNO3	0.5-1.0 L Amber glass, unpreserved	40-50ml Glass, unpreserved	0.25-1 L Plastic, unpreserved	0.2-1.0L Plastic, sterile										
1	BH7/0.2-0.3	15/12/17	Soil	1							X									
	BH7/1.5	15/12/17	Soil	1																Hold
2	BH8/0.2-0.3	15/12/17	Soil	1							X									
	BH8/1.5	15/12/17	Soil	1																Hold
3	BH9/0.2-0.3	15/12/17	Soil	1							X									
	BH9/1.5	15/12/17	Soil	1																Hold
			TOTALS	6																

SGS EHS Alexandria Laboratory

SE173824 COC

Received: 15 – Dec – 2017

Relinquished By:			Received By:			Custody Seals Intact	Y N
Gonzalo Parra		15/12/17			15/12/17	Samples Received Chilled	Y N
NAME	SIGNATURE	DATE	NAME	SIGNATURE	3:15 DATE	Method of Shipment	

NOTES: Please send samples QC1B to ALS

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