



**ENVIRONMENTAL EARTH
SCIENCES**
CONTAMINATION RESOLVED

DETAILED SITE INVESTIGATION STAGE 1A, TELOPEA NSW FRASERS PROPERTY AUSTRALIA

27 AUGUST 2020

120034

VERSION 3



27 August 2020

Frasers Property Australia

Level 2

1C Homebush Bay Drive

Rhodes NSW 2138

Attention: **Chris Koukoutaris**
Senior Development Manager

Detailed Site Investigation for Stage 1A, Telopea NSW

Please find enclosed a copy of our report entitled as above. Thank you for the opportunity to undertake this work.

Should you have any queries, please do not hesitate to contact us on (02) 9922 1777.

For and on behalf of
Environmental Earth Sciences NSW

Report Author

Natalie Eldridge
Environmental Scientist

Project Manager

Linda Lenihan
Environmental Scientist

Project Director / Internal Reviewer

James Barwood
NSW Manager

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EXECUTIVE SUMMARY

Introduction and objectives

Environmental Earth Sciences NSW was commissioned by Frasers Property Australia (Frasers) to undertake a detailed site investigation (DSI) for Stage 1A as part of a redevelopment within the suburb of Telopea, NSW with the purpose of providing supporting documentation for the detailed development application (DA) to progress the proposed Telopea Master Plan.

The main objectives of the DSI was to undertake further assessment of the Stage 1A area to complement existing information, identify any potential areas of concern with respect to contamination and refine the conceptual site model (CSM). These findings will primarily inform potential risks to human health and the environment in the context of overall redevelopment of the site.

Findings

Based upon the desktop study, site walkover, intrusive investigation and laboratory analysis the following contaminated site features were observed:

- Asbestos containing material (ACM) was located on the ground surface and within stockpiled fill material in the northern fenced off area of site. Building rubble located here is likely due to the demolition of two historic buildings noted in aerial photographs.
- Poor quality fill including the presence of bonded ACM was encountered in the south-western corner of site up to 0.5 m depth (ID: 12).

Conclusion and recommendations

Environmental Earth Sciences consider there to be a **Moderate 1** risk to human receptors in identified areas of the site due to bonded asbestos present both on the ground surface and within shallow soils.

It is recommended that prior to the proposed development works, surficial ACMs be removed by a suitably licensed contractor. As part of the development works, the poor quality fill material in southwest of the site area will require excavation and assessed for either onsite reuse or offsite disposal. Following the removal of these ACMs, the land would be considered **Low Risk** and suitable for the proposed low density residential, high density residential and recreational, open space land use.

Environmental Earth Sciences does not envisage that further detailed environmental assessment is required to delineate identified contamination, however it is recommended that an Asbestos Management Plan (AMP) is prepared for the removal of the ACM impacted fill material in both the northern portion of site and the south-western corner. Following this an inspection and validation of surrounding residual soils prior to development works to ensure bonded fragments are removed from both areas.

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1 INTRODUCTION

Environmental Earth Sciences NSW was commissioned by Frasers Property Australia (Frasers) to undertake a detailed site investigation (DSI) for Stage 1A as part of a redevelopment within the suburb of Telopea, NSW. This contamination assessment is to be provided in support of Frasers Stage 1A detailed development application (DA) to progress the proposed Telopea Master Plan. Stage 1A is located in the western portion of the proposed redevelopment surrounding Polding Place as presented in **Figure 1** (the “site”).

The site is addressed as 14 Sturt Street, Telopea, NSW and comprises three lots formally known as Lots 5, 6 and 7 of Deposited Plan (DP) 128229.

This report should be read in conjunction with limitations situated at the rear of this report and the fee proposal (PO120047_V1) issued to Frasers on 11 March 2020.

This report has been prepared by Environmental Earth Sciences NSW on behalf of *Frasers Property Telopea Developer Pty Ltd* (Frasers) and accompanies a State Significant Development application (SSDA) submitted to the NSW Department of Planning, Industry and Environment (DPIE). The SSDA seeks Concept approval, in accordance with Division 4.4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), for the staged redevelopment of the **Telopea ‘Concept Plan Area’** (CPA), as well as a detailed proposal for the first stage of development, known as **‘Stage 1A’**.

The purpose of this report is to provide undertake a detailed site investigation (DSI) for Stage 1A.

1.1 Background

The Telopea CPA forms part of the **Telopea Precinct Master Plan** (February 2017), which was prepared by NSW Land and Housing Corporation (LAHC) and Parramatta City Council to facilitate the rezoning of the precinct ultimately gazetted on 19 December 2018. The Master Plan seeks to revitalise the Telopea Precinct through the redevelopment of LAHC’s social housing assets, as well as sites under private ownership, to deliver an integrated community with upgraded public domain and community facilities – and to capitalise on access to the new Parramatta Light Rail network.

The Telopea CPA is the land identified in **Figure A** and is currently owned by LAHC. The proposed redevelopment of the CPA is part of the NSW Government *Communities Plus* program, which seeks to deliver new communities where social housing blends with private and affordable housing with good access to transport, employment, improved community facilities and open space. The program seeks to leverage the expertise and capacity of the private and non-government sectors.

In December 2019, the NSW Government announced that the Affinity consortium, comprising Frasers and Hume Community Housing, were awarded the contract to redevelop the Telopea CPA. The SSDA represents the first step in the delivery of the planned redevelopment of the Telopea CPA and the Stage 1A works will provide the first integrated market housing development on the site, as well as a new arrival plaza for the Parramatta Light Rail.

1.2 Site Description

Telopea is located in the Parramatta Local Government Area (LGA). It is approximately 4km north-east of the Parramatta Central Business District (CBD), 6km south-west of Macquarie Park Strategic Centre, and 17km from Sydney CBD.

The Telopea CPA site is approximately 13.4 (ha) and comprises 99 individual allotments (refer to **Figure A**). It currently accommodates 486 social housing dwellings, across a mix of single dwelling, townhouse, and 3-9 storey residential flat buildings. The Estate also currently accommodates a range of existing community facilities including the Dundas Community Centre, Dundas Branch Library, Community Health Centre, Hope Connect church, and Telopea Christian Centre.

The immediate surrounds comprise predominantly residential properties within an established landscape setting. The broader Precinct contains the Telopea Public School, a neighbourhood centre known as the Waratah Shops, and two large Council parks known as Sturt Park and Acacia Park.

1.3 Proposed Development

The SSDA seeks Concept approval for the staged redevelopment of the Telopea CPA, as well as a detailed proposal for the first stage of development. The Concept proposal sets out the maximum building envelopes and GFA that can be accommodated across the CPA, and identifies the land uses and public infrastructure upgrades to be provided. The Concept proposal will establish the planning and development framework from which any future development application will be assessed against.

The Telopea CPA is divided into four precincts known as Core, North, South and East incorporating a total of 29 parcels as presented on **Figure A**. The Concept proposal is further detailed in Urban Design Report prepared by Plus Architecture and Landscape Report prepared by Hassell.

The first stage of works to be delivered (known as 'Stage 1A') is located within the Core precinct adjacent to the Parramatta Light Rail station and is proposed to include:

- Site establishment works, including demolition of all existing buildings and structures, tree removal, site preparation, excavation, and services augmentation.
- Construction of a new arrival plaza for the Parramatta Light Rail, incorporating a Community Pavilion.
- Construction of the Sturt Street extension, Light Rail crossing including Adderton Road intersection works and cycleway connection.
- Part demolition and upgrade of Sturt and Shortland streets including new kerb-realignment, new footpaths and landscaping, new parking bays, bus zones, line marking and crossing.
- Construction of a new public park surrounding the existing significant trees.

- Construction of residential flat buildings, up to 10-storeys in height, including studio, one, two and three bedroom apartments.
- Construction of two basement levels, with access / egress via Sturt Street and Winter Street, including waste and loading facilities.
- Associated open space and landscaping works, including retention of existing significant trees, ground and rooftop communal open space, and a publicly accessible through site link.

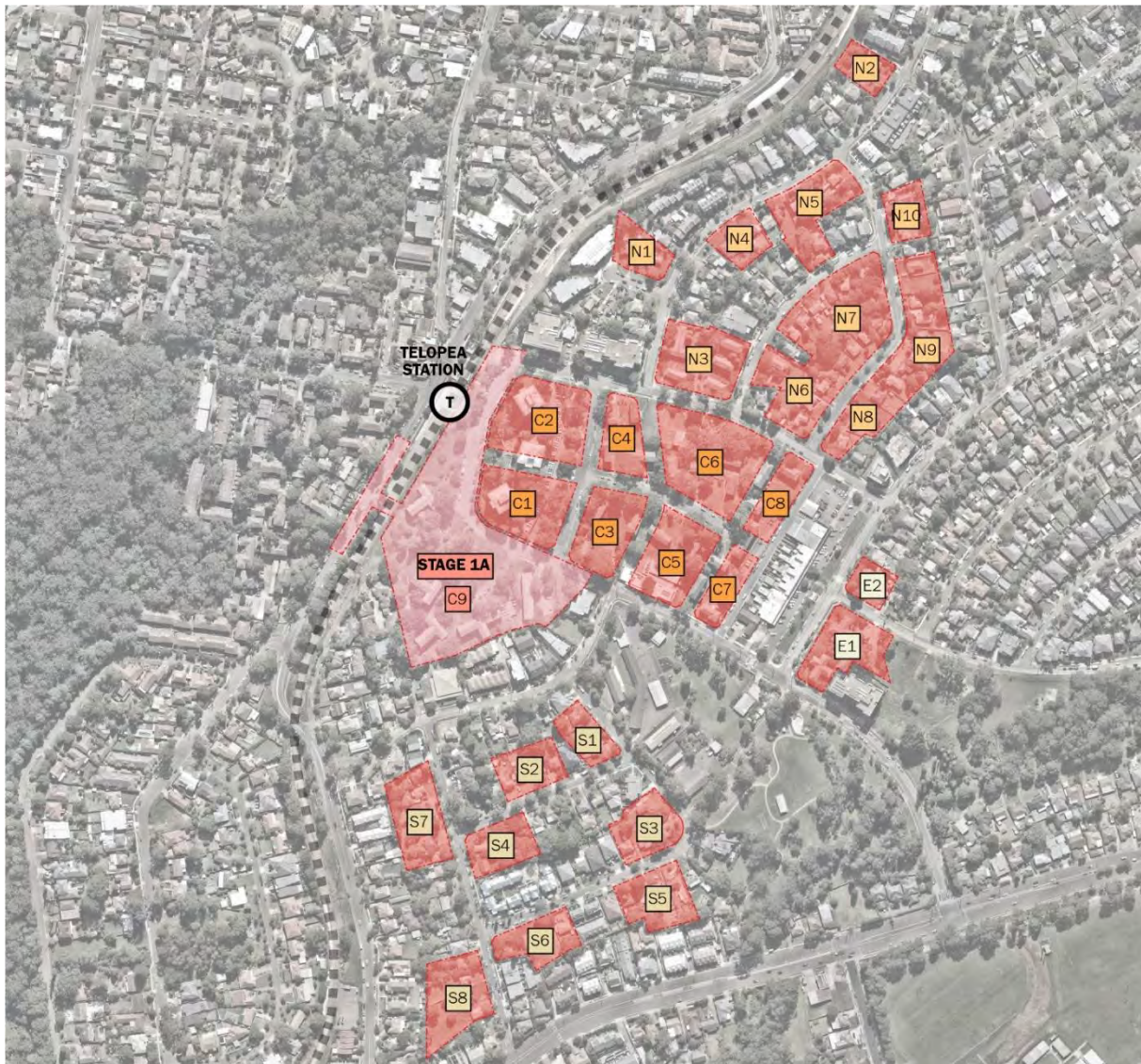


Figure A: Telopea estate concept plan

2 OBJECTIVES

The main objectives of the DSI was to undertake further assessment of the Stage 1A area to complement existing information, identify any potential areas of concern with respect to contamination and refine the conceptual site model (CSM). These findings will primarily inform potential risks to human health and the environment in the context of overall redevelopment of the site.

Conclusions will be provided to inform the sites suitability for the proposed medium to high density residential and open space / recreational land uses. Recommendations for additional investigation to further delineate contamination risk(s) and/or remediation to limit potential environmental liability / financial risk(s) associated with delivering the proposed Master Plan will also be provided (if required).

3 WORKS UNDERTAKEN

3.1 Preliminary works

Prior to the intrusive investigation, the following preliminary works were undertaken:

- Preparation of a safe work methods statement (SWMS);
- Completion of a Dial Before You Dig (DBYD) online search of known utilities;
- Service location undertaken to confirm known utilities and identify 28 clear areas to commence the intrusive investigation; and
- Letter box drop to all Polding Place residents explaining the details of the intrusive investigation to go ahead.

3.2 Desktop searches

Environmental Earth Sciences undertook a review of the following available information for the site:

- Soil, geology, topography, hydrology and hydrogeology, acid sulfate soils, salinity and meteorology maps and databases.
- NSW Office of Water records on registered groundwater bores within 500 m of Stage 1A.
- Historical land title certificate.
- Council planning certificate information under Section 10.7 (parts 2 and 5) of the *Environment Planning and Assessment Act 1979*.

- Available historic aerial photography.
- NSW Environment Protection Agency (EPA) search register of notified properties under the Contaminated Land Management act 1997 (CLM Act) subject to investigation / remediation orders.
- NSW EPA search of Environmental Protection Licenses under the Protection of the Environment Operation Act 1997 (POEO Act).

3.3 Fieldwork and laboratory analysis

Fieldwork was undertaken by Environmental Earth Sciences' representatives on 3rd and 6th April 2020. A complete description of fieldworks undertaken, and laboratory analysis has been provided in **Section 7**.

4 SITE IDENTIFICATION AND SETTING

4.1 Location and property description

Site identification details are provided in **Table 1** below. A plan of the regional locality of the site is provided in **Figure 1**, with site layout, features and sampling locations presented in **Figure 2**.

Table 1: Site identification

Item	Details
Site owner	NSW Land and Housing Corporation (LAHC)
Address	14 Sturt Street, Telopea NSW
Lot and Plan number	Lots 5, 6 and 7 of DP 128229
Area	2.1 hectares (ha)
Current land use	High density residential with some open space areas
Proposed land use	Low- high density residential and open space / recreation land use
Current zoning ¹	R4 – High Density Residential (lower portion of site) RE1 – Public Recreation (northern and eastern portion of site)
Site location and layout	Figure 1 - Figure 2

Notes:

1. Sourced from Parramatta Local Environmental Plan (LEP) 2011, *Land Zoning Map Sheet LZN_014*.

4.2 Site surrounds

Features of surrounding land uses identified in the immediate vicinity of the site area as observed during field investigations are summarised in **Table 2** below.

Surrounding site uses

Table 2:

Direction	Description
North	The site is bound to the north by the Telopea railway line, soon to be converted into the Parramatta light rail line. Beyond this are more residential precincts and housing.
South	High density residential properties are located south of site alongside Telopea Public School. The Ponds Creek is located approximately 410m to the south-east of site.
East	The site is bound to the east by Sturt Street and high-density residential properties beyond.
West	North west of site is the Telopea railway line. Beyond this is Adderton Road, with residential properties and Vineyard Creek Reserve and Vineyard Creek further west. South west of the site consists of residential properties, Winter Street and Telopea railway line beyond.

4.3 Sensitive receptors

The nearest sensitive human receptors are the site users (occupants, visitors, maintenance/construction workers), residents and visitors of adjacent residential properties.

Onsite sensitive environmental receptors include the ecological communities which inhabit the soil and groundwater beneath the site.

The nearest sensitive ecological receptors are:

- Vineyard Creek Reserve approximately 150m west of site;
- Vineyard Creek approximately 300m west of site; and
- The Ponds Creek approximately 410m south-east of site.

4.4 Topography and vegetation

The Glenorie Soil Landscape information card sourced from the interactive website eSPADE (accessed 23 April 2020) from the NSW Office of Environment & Heritage has information on the topography and vegetation located onsite. Regional landscape is described as being characterised by undulating hills with narrow ridges and hillcrests with a local relief of 50 - 120m and 5 - 10% slopes. Moderately inclined slopes of 10 – 15% are noted to be the dominant landform elements.

Vegetation is extensively cleared in the high-density residential suburb of Telopea. Some vegetation remains onsite such as large trees and manicured grasses.

4.5 Regional geology

The Sydney 1:100 000 Geological Series Sheet 9130 (Geological Survey of NSW, 1983) describes the regional geology underlying the majority of the site as Wianamatta Group consisting of shale, and laminate (Rwa). The Ashfield Shale is comprised of laminite and dark grey shale. Bringelly Shale consists of shale, calcareous claystone, laminite, fine to medium grained lithic-quartz sandstone (Herbert, 1983).

4.6 Soils

The soils underlying the site belong to the erosional Glenorie Soil Landscape as classified in the interactive website eSPADE (accessed 23 April 2020) from the NSW Office of Environment & Heritage. A soil landscape is an area of land that has recognisable and specifiable topographies and soils. The Glenorie soil landscape typically includes shallow to moderately deep red podzolic soils on crests with red and brown podzolic soils on upper slopes. Gleyed podzolic soils may be noted among drainage lines, which were potentially noted as reworked material at some areas of the site.

4.7 Hydrogeology and drainage

4.7.1 Site drainage

As the site is predominately covered with grassed open areas and trees, most rainwater is expected to percolate directly through the surface soil. The remainder of the site areas is covered by buildings or car park hardstand, and in this case, rainfall will be directed into local stormwater drains.

4.7.2 Groundwater

According to Bureau of Meteorology (BoM) *Groundwater Explorer* (<http://www.bom.gov.au/water/groundwater/explorer/map.shtml> accessed, 22 April 2020) there are no groundwater wells located within 500m of the site.

4.7.3 Groundwater dependent ecosystems

An assessment of the BoM *Groundwater Dependent Ecosystems Atlas* (<http://www.bom.gov.au/water/groundwater/gde/map.shtml> accessed 22 April 2020) suggests that the study area does not have any groundwater dependant ecosystems that rely upon it.

However, there are terrestrial GDEs of Hinterland Sandstone Gully Forest and Sydney Turpentine Ironbark Forest within 500m of the site. These are located within the bushland the north-west of the site beyond the Parramatta light rail works. No aquatic or subterranean GDEs are noted to be on or nearby the site.

4.7.4 Flood risk

Based upon information from the City of Parramatta, the site is considered to be above the 1 in 100 year flood level. In any case, any development must adhere to the development control plans (DCP) for the City of Parramatta, as relevant.

4.8 Acid sulfate soils

The potential acid sulfate soils (PASS) risk maps (**Appendix A**) published by the Parramatta Local Environmental Plan 2012 (LEP) states that the site is located on land of Class 5 acid sulfate soils risk.

Typically, acid sulfate soils are not found in areas identified as Class 5. The site is also not within 500m of Class 1, 2, 3 or 4 risk and therefore, if dewatering is required in the proposed

development, the surrounding land is not expected to be at risk of the effects of acid sulfate soils.

4.9 Salinity

Salinity is considered low risk onsite due to information presented in the Glenhaven Hydrogeological Landscape (HGL) information sheet, sourced from the interactive website eSPADE (accessed 23 April 2020) from the NSW Office of Environment & Heritage. The Glenhaven HGL does not exhibit any significant signs of salinity, potentially due to higher rainfall and the soil is deeper and therefore well drained so it stores less salt, with occasional sites appearing in the more poorly drained areas of the lower slopes and drainage depression. Salt export is low due to limited salt expression, high run-off and sandstone dominated drainage lines. Water EC is generally low in the incised sandstone streams, however can become higher in the shale drainage line.

4.10 Climate and meteorology

Regional meteorological data has been sourced from the BoM (www.bom.gov.au, verified 20/04/2020) with monthly rainfall data received from Parramatta North (Masons Drive) weather station (located approximately 2.3 km west of the site). Average monthly rainfall volume was calculated from 1965, mean maximum and minimum monthly temperatures were calculated from 1967. This information is presented in **Table 3**.

Table 3: Average monthly climate data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum Temperature (°C)	29	28	26	24	21	18	18	19	22	24	26	28
Minimum Temperature (°C)	18	18	16	13	10	8	6	7	9	12	14	16
Rainfall (mm)	102	126	113	90	66	93	44	55	50	68	83	72

5 HISTORICAL INFORMATION

5.1 Historical aerial photograph review

The earliest historical photograph for this site available was from 1943 and this reveals the area to be predominately rural at that time, where currently it is noted to be high density residential. A review of aerial photographs and other available imagery of the site is presented in **Table 4** with historical photography located in **Appendix B**.

Table 4: Review of aerial photographs

Year	Colour / B & W	Notes
1943	B & W	<p>Onsite: The site area appears to be rural land with minimal vegetation, some trees in the western portion of site.</p> <p>Offsite: Site surrounds include more rural / residential properties in all directions. Directly east of site is the Telopea railway line and beyond this Vineyard Creek and Vineyard Creek reserve.</p>
1955	B & W	<p>Onsite: Polding Place and Sturt Street have been developed, potentially one structure has been built to the central-eastern portion of site.</p> <p>Offsite: All roads and streets in western portion of Telopea have begun development, houses are starting to be constructed in the north eastern and central southern areas of the suburb.</p>
1965	B & W	<p>Onsite: Site remains similar to previous, however, the potential structure residing in the central-eastern portion of site no longer remains.</p> <p>Offsite: Majority of the western portion of Telopea has been developed into high density residential. Only areas undeveloped are the site, and those lots north-east of site between Sturt Street and Shortland Street.</p>
1971	B & W	<p>Onsite: Site remains similar to previous.</p> <p>Offsite: Lots directly to the east of site, off Wade St and Eyles street, now have developed residential buildings.</p>
1975	B & W	<p>Onsite: Site now has seven large structures, four to the south and three in the central northern portion of site. Central-eastern area of site is potentially bare ground.</p> <p>Offsite: Lots directly north of site appear to still be under development.</p>
1986	Colour	<p>Onsite: Site remains similar to previous except for central-eastern portion of site now is a landscaped open grassy space with footpaths.</p> <p>Offsite: Lots directly north of site appear to have completed development, all western Telopea is developed into high density residential.</p>
1991	Colour	<p>Onsite: Site remains similar to previous.</p> <p>Offsite: Surrounds are similar to previous.</p>
1994	Colour	<p>Onsite: Site remains similar to previous. Trees have grown to a larger size.</p> <p>Offsite: Surrounds are similar to previous.</p>
2004	Colour	<p>Onsite: Site remains similar to previous.</p> <p>Offsite: Surrounds are similar to previous.</p>
2007	Colour	<p>Onsite: Site remains similar to previous.</p> <p>Offsite: Surrounds are similar to previous.</p>
2010	Colour	<p>Onsite: Site remains similar to previous.</p>

Year	Colour / B & W	Notes
		Offsite: Surrounds are similar to previous, however, earthworks occurring near the train station entrance on the corner of Sturt St and Shortland St.
2014	Colour	Onsite: Two smaller buildings to the north of site are no longer there. The five larger buildings remain. Offsite: Surrounds are similar to previous, however, two new buildings near the train station entrance on the corner of Sturt St and Shortland St have been completed.
2020	Colour	Onsite: Site remains similar to previous. Offsite: Surrounds are similar to previous.

5.2 Review of historical title certificates

A review of Historical Title Certificates is presented in **Table 5**. Historical title information for 14 Sturt Street (Lots 5, 6 and 7 of DP 128229) were sourced from Parsons Brinkerhoff Pty Ltd (PB) (2009) – *Phase 1 Environmental Site Assessment, Housing NSW Properties: Telopea Renewal Project, Telopea NSW 2117* (ref: 21608A PR_1281RevA; 21 December 2009).

Table 5: Historical land titles

Year	Proprietor
1989 – to date	The Housing Commission of New South Wales
1959 - 1989	The Housing Commission of New South Wales
1947 – 1959	The Housing Commission of New South Wales
1941 – 1947	Arthur Farquar Webster, bacteriologist
1938 – 1941	Kenneth Victor Randolph Douglas, bank manager
(1941 – 1944)	(Lease to Arthur Farquar Webster, bacteriologist)
1936 – 1938	Michael Barry, builder
1936 – 1936	John Jeremiah Leahy, grazier
1936 – 1936	Frederick Ernest Spurway, nursery man
1895 - 1936	Charles Robert Mobbs, fruit grower

5.3 Review of council planning certificate

A search of the Parramatta planning certificate made under Section 149 of the EP&A Act indicated that no significant issues in relation to contaminated land, management orders,

voluntary management proposals (VMPs), ongoing maintenance orders or site audit statements (SAS) associated with the site are noted. Note that the information was sourced from a planning certificate obtained in 2009. However, due to other historical information indicating very minimal changes to the site it is not considered necessary to obtain the most recent planning certificate information.

The planning certificate for Lot 6 was sourced from Parsons Brinkerhoff Pty Ltd (PB) (2009) – *Phase 1 Environmental Site Assessment, Housing NSW Properties: Telopea Renewal Project, Telopea NSW 2117* (ref: 21608A PR_1281RevA; 21 December 2009); with relevant information provided below for the site:

- Is **not** significantly contaminated within the meaning of that Act at the date when the certificate was issued;
- Is **not** subject to a management order within the meaning of that Act at the date when the certificate was issued;
- Is **not** the subject of an approved voluntary management proposal with the meaning of that Act when the certificate was issued;
- Is **not** the subject of an ongoing maintenance order within the meaning of that Act when the certificate was issued;
- Is **not** the subject of a SAS within the meaning of that Act if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

5.4 NSW EPA contaminated sites register

A search of the NSW EPA contaminated land public record database showed no notices or records for the site.

5.5 Sites notified to NSW EPA

A search of the NSW EPA contaminated land public record database showed no notices or records for the site. No notified sites were recorded within a 1 km radius of the site or within the suburb of Telopea.

6 INVESTIGATION CRITERIA

Site investigation criteria have been selected to provide an appropriate indication of the environmental status of the site with consideration three possible land use criteria, ranging from low density residential (HIL A), high density residential (HIL B) and recreational / open space (HIL C). In accordance with current legislation, Environmental Earth Sciences refers to the ASC NEPM (2013) guidelines for interim site assessment criteria.

Typically for contaminant concentration to be considered acceptable for the respective land use criteria, the data set must conform to the following requirements:

- The 95% upper confidence limit (UCL) of the arithmetic mean of analytical results is below the site criteria;
- The arithmetic (or geometric in cases where the data is log normally distributed) mean is below the site criteria;
- The standard deviation is less than 50% of the site criteria; and
- No single sample analytical result is greater than 250% of the site criteria.

A range of threshold guidelines will be adopted from ASC NEPM (2013) as interim remediation criteria for the assessment of acceptable concentrations of contaminants in soils. For soil, these investigation levels are derived from toxicity of substances and estimated exposure of humans under various land use scenarios and soil management practices.

6.1 Site suitability criteria

6.1.1 Health investigation levels (HILs)

Health-based investigation levels (HILs) will be applied to the site for potential use as any of the following land uses and are presented for reference in **Table 6**.

- HIL A - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare 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 apartments.
- HIL C - Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate.

Table 6: Health investigation levels for soil contaminants

Health Investigation Level	HIL A (mg/kg)	HIL B (mg/kg)	HIL C (mg/kg)
Heavy Metals			
Arsenic	100	500	300
Cadmium	20	150	90
Chromium (VI)	100	500	300
Copper	6,000	30,000	17,000
Lead	300	1,200	600
Mercury (inorganic)	40	120	80
Nickel	400	1,200	1,200

Health Investigation Level	HIL A (mg/kg)	HIL B (mg/kg)	HIL C (mg/kg)
Zinc	7,400	60,000	30,000
PAHs			
Carcinogenic PAHs (as BaP TEQ) ¹	3	4	3
Total PAHs	300	400	300
OCC/OCPs			
DDT+DDE+DDD	240	600	400
Aldrin and dieldrin	6	10	10
Chlordane	50	90	70
Endosulfan	270	400	340
Endrin	10	20	20
Heptachlor	6	10	10
HCB	10	15	10
Methoxychlor	300	500	400
Chlorpyrifos	160	340	250

Notes:

1. Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) (potency relative to benzo(a)pyrene [B(a)P]. The B(a)P toxic equivalent (TEQ) is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF, given below, and summing these products

6.1.2 Health screening level (asbestos)

Health screening levels for asbestos in soil, which are based on scenario-specific likely exposure levels, are adopted from the ASC NEPM (2013) and outlined in **Table 7**.

Table 7: Health screening levels for asbestos contamination in soil

Form of asbestos	HSL (w/w)		
	Residential A	Residential B	Recreational C
Bonded ACM ¹	0.01%	0.04%	0.02%
FA ¹ and AF ¹ (friable asbestos)	0.001%		
All forms of asbestos	No visible asbestos for surface soil		

Notes:

1. ACM – Bonded asbestos containing material; FA – Fibrous asbestos; AF – Asbestos fines

6.1.3 Health screening levels (petroleum hydrocarbons)

For petroleum hydrocarbons, health screening levels (HSLs) have been derived in ASC NEPM (2013) based upon fraction ranges of hydrocarbons together with soil texture classes.

The actual soil texture class applied will be determined during description of soil in the field assessment.

The HSL criteria, whilst non-limiting (NL) for vapour intrusion, are provided to prevent the occurrence of phase-separated hydrocarbons (PSH). The soil texture for applications of HSLs at the site will be “clay”. Fractions F3 ($>C_{16}-C_{34}$) and F4 ($>C_{34}-C_{40}$) are semi-volatile and are not of concern for vapour intrusion, however, exposure to human receptors can occur via direct pathways such as dermal contact.

Health screening levels for all HSL land use criteria for clay soil were used to screen petroleum hydrocarbons in soil for potential vapour intrusion risk. Values for clay with depth criterion to < 1 metres was used. The HSL criteria are summarised in **Table 8**.

6.1.4 Ecological screening levels (ESLs)

For petroleum hydrocarbons, ESLs have been derived in ASC NEPM (2013) based upon fraction ranges of hydrocarbons, BTEXN component and benzo(a)pyrene (BaP) together with soil texture classes. These ESLs are of low reliability except for the volatile and semi-volatile hydrocarbon fractions which are of moderate reliability. Nonetheless the ESLs will be adopted for the investigation to be protective of soils in a commercial / industrial land use scenario.

The adopted ESLs are designed to be protective of soil fauna, soil processes plants. The ASC NEPM (2013) states that these factors only apply within the rhizome (i.e. zone in the top two metres of soil) and as such ESL criteria need not be applied to chemical results below this depth. ESL threshold criteria are summarised in **Table 8**.

It should be noted that the ASC NEPM (2013) ESL for benzo(a)pyrene are low-reliability values and as such are considered over conservative. To develop the ESL thresholds in ASC NEPM (2013), a review of Canadian soil quality guidelines was undertaken for BTEX and benzo(a)pyrene, with the Australian methodology applied to the ecotoxicological data as far as possible to derive equivalent ESLs.

It is recognised that the bioavailability of B(a)P and hence toxicity can reduce through sorption to organic material in the soil, with ageing, and with certain soil properties and other factors. However, methods have not yet been developed that can reliably measure the bioavailability of B(a)P and using bioavailability or bio-accessibility measures to derive site-specific criteria for organic contaminants is not well established in Australia (CRC Care, 2017).

With respect to the ESLs, the ASC NEPM (2013) did not consider bioavailability, and therefore there is a concern that the value for benzo(a)pyrene may be overly conservative, hence the CRC Care (2017) threshold value of 33 mg/kg has been adopted.

Table 8: Health and Ecological screening levels for soil contaminants

Analyte	Soil Texture	HSL (mg/kg dry Soil)		ESL (mg/kg dry Soil)	
		HSL A & HSL B	HSL C	Areas of ecological significance	Urban residential and public open space
F1 (C₆- C₁₀)	Fine	50 (0 - < 1m) 90 (1 - < 2m) 150 (2 - < 4m) 290 (> 4m)	NL	125*	180*
F2 (>C₁₀-C₁₆)	Fine	280 (0 - < 1m) NL (1 - > 4m)	NL	25*	120*
F3 (C₁₆- C₃₄)	Fine	-	NL	-	1,300
F4 (>C₃₄-C₄₀)	Fine	-	NL	-	5,600
Benzene	Fine	0.7 (0 - < 1m) 1 (1 - < 2m) 2 (2 - < 4m) 3 (> 4m)	NL	10	65
Toluene	Fine	480 (0 - < 1m) NL (1 - > 4m)	NL	65	105
Ethylbenzene	Fine	NL	NL	40	125
Xylenes	Fine	110 (0 - < 1m) 310 (1 - < 2m)	NL	1.6	45
Benzo(a)pyrene	Fine	-	-	33	33

Notes: * indicates that the ELS is of moderate reliability.

6.1.5 Ecological investigation levels

The ecological investigation levels (EILs) assigned by ASC NEPM (2013) – *Schedule B5a: Guideline on Ecological Risk Assessment* are adopted for this assessment. This guideline presents the methodology for deriving terrestrial EILs using both fresh and aged (i.e. >2 years old) contamination for soil with the following land use types:

- Areas of ecological significance.
- Urban residential/ public open space.
- Commercial / industrial.

The methodology has been developed to protect soil processes, soil biota (flora and fauna) and terrestrial invertebrates and vertebrates. The proposed land use at the site is for urban residential and open space land use, as such the adopted EILs for this validation will be protective of this scenario. Applicable EILs derived for the validation have been derived in

this SMP and comprise the sum of ambient background concentrations (ABCs) and added contaminant limits (ACLs).

The ACL concentrations ascertained for representative locations are usually based on the site-specific results for either pH alone, or pH and cation exchange capacity (CEC). These analyses were not undertaken during site assessment and so the most conservative values will be utilised accordance with procedures in ASC NEPM (2013) – *Schedule 5c: - EILs for As Cr Cu DDT Pb Naphthalene Ni Zn*. Refer to a summary of site-specific EILs in **Table 9**.

Table 9: Ecological investigation levels for soil contaminants

Analyte	EIL Urban Residential and Public Open Space (mg/kg)
Naphthalene	170
Lead	1,100
Arsenic	100
Chromium III	190
Copper	60
Nickel	30
Zinc	70
DDT	180

6.1.6 Management limits for hydrocarbon fractions

Applicable management limits (MLs) have been set for TRH fractions in soil for residential and open space / recreational land use scenario (ASC NEPM, 2013). These MLs are primarily for protection of human health through the direct contact pathway, with applicable criteria detailed in **Table 10**.

Table 10:

Management limits for TRH fractions in soil

TRH Fraction Ranges	Management Limits (mg/kg dry weight)
	Residential, parklands and public open space (fine texture)
TRH (C ₆ -C ₁₀) including BTEX	180
TRH (>C ₁₀ -C ₁₆) including naphthalene	120
TRH (>C ₁₆ -C ₃₄)	1,300
TRH (>C ₃₄ -C ₄₀)	5,600

7 FIELDWORK PROGRAM

7.1 Site walkover

A site walkover was undertaken by Environmental Earth Sciences representatives on 3 April 2020. **Figure 2** indicates site features and Photo Plates of the site are presented in **Appendix C**.

Surrounding the five main buildings onsite was mainly vegetation of grasses and trees (Plate 1) and foot paths and clothes lines (Plate 2) for the occupants of the residential buildings. One large grassed area (Plate 3) was observed in the centre of site, with grassed mounds (Plate 4) and pathways to the central-eastern portion of this.

In the northern portion of site there was a fenced off area with overgrown grass and one brick wall in poor condition (Plate 6 and Plate 7), on the Sturt Street side. Behind the brick wall was identified fill material with building rubble inclusions (Plate 7). Fragments of potential asbestos-containing material (PACM) were noted amongst the building rubble (Plate 8), alongside brick, tiles and concrete.

The northern boundary of site backed onto a Transport for NSW worksite for the new Parramatta light rail. This area was mainly public grassed parkland (Plate 9).

7.2 Intrusive investigation

The intrusive soil investigation was undertaken by Environmental Earth Sciences representatives on 6 April 2020. **Figure 2** indicates site features and sampling locations with Photo Plates of the site and materials observed presented in **Appendix C**.

7.2.1 Rationale

In accordance with the NSW EPA *Sampling Design Guidelines* (1995) for a site of approximately 2.1 ha it is recommended that 31 soils sampled are to be collected to detect a contamination hotspot of 30.5 m diameter with 95% confidence. Three sampling locations were previously investigated by Environmental Earth Sciences in 2019 (ID: BH1, BH2 and BH3):

- Environmental Earth Sciences (2019), *Due Diligence Risk Assessment of Proposed Telopea Master Plan Site, Telopea, NSW, Frasers Property Australia* (dated 8 November 2019, reference 119095_V2).

Therefore, 28 primary samples (ID: 1 - 28) were required for the 2020 sampling event to compile with the Sampling Design Guidelines. **Figure 2** outlines the sampling locations from both sampling events.

7.2.2 Assessment and sampling

Assessment and sampling was undertaken at 31 locations onsite with reference to Standards Australia AS 4482.1 (2005) — *Guide to the investigation and sampling of sites with potentially contaminated soil*. In Environmental Earth Sciences (2020) investigation intrusive assessment was undertaken using a hand auger to a maximum depth of 1.0 metre below

ground level (mBGL). In Environmental Earth Sciences (2019) BH1 was mechanically drilled to 2.4 m BGL.

Material assessment at each location including recording physical soil characteristics such as material type, colour, texture, moisture, inclusions, foreign materials and indications of visual / olfactory contamination.

Sampling depth, descriptions and laboratory analytical program and results undertaken by Environmental Earth Sciences for the assessment are detailed in **Section 8** and borelogs provided in **Appendix D**.

7.2.3 Laboratory analysis

In total, 33 soil samples were sent to the laboratory for analysis, with at least one sample selected from each location. The following potential contaminants of concern were analysed:

- Total Recoverable Hydrocarbons (TRH) (Fractions C₆-C₄₀).
- Benzene, Toluene, Ethylbenzene, and Total xylenes (BTEX).
- Polycyclic Aromatic Hydrocarbons (PAH).
- Heavy metals (As, Cd, Cr_{TOTAL}, Cu, Hg, Ni, Pb and Zn).
- Asbestos - presence / absence in soil.

Four fragments of PACM (ID: PACM1 – PACM4) were tested for the following:

- Asbestos - presence / absence in materials.

Two field / blind duplicates were also collected to comply with a tested rate of 1 in 20 primary samples for quality assurance / quality control (QA/QC) purposes.

8 RESULTS

8.1 Observations and material description

Observations of soil characteristics and stratigraphy were generally consistent across the site with horizon thicknesses varying slightly between locations. An exception to this was stockpiled fill material in the northern fenced off area of site which was impacted with ACM. Similarly, asbestos impacted fill material was located below the ground surface in the south western corner of site (Borehole ID: 12).

Majority of soil sampling locations encountered fill material and/or reworked natural soil materials. A description of site soil conditions is presented in a ground model in **Table 11** with complete borelogs in **Appendix D** including depths of fill and natural material encountered at each sampling location.

Table 11: Ground model

Area of site	Strata	From min / max (mBGL)	To min / max (mBGL)	Average thickness (m)	Comments
Covered majority of site	NATURAL: Soft dark brown CLAY.	0.0	0.7	0.31	Generally covered the surface of site.
Covered majority of site	NATURAL: Firm red-brown CLAY.	0.1	1.0	0.29*	Generally located across the whole site at depth.
Northern portion of site only	FILL: Brown sandy clay with rootlets, concrete gravels, tile, pieces of glass and PACM.	0.0	2.0	Stockpile max height was 2.0m, average was ~1.5m	Fill material located within the fenced area, in the northern portion of site (ID: 24, 25, 26, BH1).
Central-eastern portion of site	REWORKED NATURAL: Brown grey CLAY.	Top of stockpile	1.0 below top of stockpile	Stockpile max height ~1.5m	Reworked natural material located within landscaped stockpiled in the central-eastern portion of site (ID: 15, 16, 17).
South western corner of site	FILL: Dark brown clay with PACM.	0.0	0.5	0.5	Only noted at one location (ID: 12)
Western border of site	FILL: Dark brown clay with red-grey-orange clay inclusions with brick, tile fragments, white tile, concrete and glass pieces.	0.0	0.7	0.49	Fill material located at the western border of site, appeared to be reworked natural with anthropogenic inclusions (ID: 10, 13, 14, 20).

Note:

*This is the average thickness of material observed across the site. Most boreholes stopped before reaching a new soil horizon in this material.

8.2 Laboratory analysis

8.2.1 Chemical contamination

All recorded chemical concentrations were below the acceptable criteria for low density residential, high density residential and open space and recreational land use.

The only analysis result recorded above the adopted investigation criteria, were zinc concentrations recorded, above the EIL criteria, at four locations:

- Zinc at 3/0.1-0.2m: 100 mg/kg – above the EIL of 70 mg/kg for aged zinc in soil.
- Zinc at 4/0.4-0.5m 100 mg/kg > EIL (70 mg/kg).
- Zinc at 5/0.3-0.5m: 99 mg/kg > EIL (70 mg/kg).
- Zinc at 11/0.2-0.3m: 92 mg/kg > EIL (70 mg/kg).

- Zinc at 22/0.3-0.4m: 91 mg/kg > EIL (70 mg/kg).
- Zinc at 26/0.2-0.4m: 79 mg/kg > EIL (70 mg/kg).

Dataset for Zinc subjected to statistical analyses to calculate the 95% UCL_{AVERAGE}. Calculated result = 49.7 mg/kg, which is < EIL criteria of 70 mg/kg. Dataset subjected to statistical analyses to calculate the 95% UCL_{average} are included in **Appendix G**.

A results summary table for chemical analysis (**Table A**) is located in **Appendix E** with complete laboratory transcripts and chain of custody documentation located in **Appendix F**.

8.2.2 Asbestos

All results for asbestos testing in soil were returned absent for asbestos except for one sample (ID: 12/0.2-0.4) whereby fragments of fibre cement / bonded ACM was located within the soil at shallow depth. Laboratory analysis confirmed the presence of chrysotile, amosite and crocidolite asbestos.

All four PACM (ID: PACM1 - PACM4) samples sent for laboratory analysis were confirmed to be ACM, with PACM1 and PACM4 containing chrysotile, amosite and crocidolite asbestos and PACM2 and PACM3 containing chrysotile asbestos.

A results summary table for asbestos testing (**Table B**) is located in **Appendix E** with complete laboratory transcripts and chain of custody documentation located in **Appendix F**.

8.3 Quality Assurance / Quality Control

Quality control (QC) is achieved by using NATA registered laboratories using American Society for Testing and Materials (ASTM) standard methods supported by internal duplicates, the checking of high, abnormal or otherwise anomalous results against background and other chemical results for the sample concerned.

Quality assurance (QA) is achieved by confirming that field results, or anticipated results based upon comparison with field observations, are consistent with laboratory results. Also, that sampling methods are uniform, and decontamination is thorough. In addition, the laboratory undertakes additional duplicate analysis as part of their internal quality assurance program on the basis of one duplicate analysis for every 20 samples analysed.

Field observations are compared with laboratory results when they are not as expected. Confirmation, re-sampling and re-analysis of a sample are undertaken if the results are not consistent with field observations and/or measurements. In addition, field duplicate sample results have to be within the acceptable range of reproducibility.

8.3.1 Sampling controls

Decontamination procedures carried out between sampling events included the following.

All sampling equipment that was re-used which came into contact with soil samples, were thoroughly washed with detergent (Decon 90 or similar) water, then rinsed with clean water and dried before the collection of each sample. Any items accidentally contaminated were similarly washed before re-use.

Soil samples were collected from soil profiles removed from the centre of the hand auger. New nitrile gloves were used at each sampling location. During this process the field scientist would also determine the colour and texture of the soil sample.

8.3.2 Intra (blind) duplicate sampling

The intra (blind) duplicate samples were collected at a rate of one duplicate per twenty samples collected (5%). Duplicate samples were split evenly distributing the soil sample between two clean glass jars. The field scientists typically attempt to disturb soils as little as possible. For this project two intra (blind) duplicate samples were collected for analysis.

The summary of the relative percentage differences (RPDs) of the intra duplicate sample is presented in **Table C (Appendix E)**. All analytes were within 50% RPD with the exception of copper, nickel and zinc for the second pairing (ID: 21/0.2-0.4 and FD2). However, this is consistent with visual observations of fill material in this location being quite variable throughout the horizon and so is not considered to invalidate the dataset.

8.3.3 Blanks and spikes

One trip spike / trip blank pair was collected as part of the soil sampling program to confirm that cross contamination did not occur during transit of samples.

The trip spike results were reported within laboratory accepted percentage recoveries (no less than +/- 10%) which indicates that samples were handled appropriately in during transit with low chance for volatile loss. One exception is for toluene which had a recovery of 123%, however, this is not expected to invalidate the dataset as it was only one outlying result and majority of primary samples were noted to have a concentration of volatile analytes below the LOR.

The trip blank results reported chemical concentrations below the LOR, which indicates that no potential cross contamination occurred during transit.

The results of the trip spike and trip blanks are presented in **Table 12**.

Table 12: Trip spike and trip blank results

Analyte	LOR	Units	TS	TB
Benzene	0.2	mg/kg	108%	<0.2
Toluene	0.5	mg/kg	123%	<0.5
Ethylbenzene	1	mg/kg	101%	<1
m+p - xylene	2	mg/kg	101%	<2
o - xylene	1	mg/kg	98%	<1
TRH C6 - C10	25	mg/kg	----	<25
TRH C6 – C10 less BTEX (F1)	25	mg/kg	----	<25

Notes:

LOR: Laboratory limit of reporting

Mg/kg: milligrams per kilogram

8.3.4 Laboratory QA/QC

Laboratory analysis of primary and intra (blind) duplicate samples for this project were completed by Envirolab Services Pty Ltd (Envirolab), who are accredited by NATA for the methods used, details of this accreditation can be viewed at <http://www.nata.asn.au/>, while details of the samples sent to the laboratory and the analysis requested are contained in the chain of custody documentation held in **Appendix F**. The analytical methods are noted on the laboratory transcripts.

The collection date of samples, laboratory extraction date and allowable holding times are presented in the laboratory quality reports. All analysis was completed within the allowable holding times.

Acceptable limits of reporting (LOR) were provided by the analytical laboratory to allow the results to be compared against the adopted soil investigation levels.

No method blank, laboratory duplicates, laboratory control spikes, matrix spikes or surrogate recovery outliers exist in the laboratory QAQC procedures with the exception of one duplicate. The RPD calculated for arsenic in one sample (Laboratory ID: 240507-11) by Envirolab was 57%. This was for a sample (EES ID: 10/0.4-0.5) which was noted in the field to be quite variable in its matrix and inclusions. This is not expected to invalidate the dataset and no other outliers were recorded by Envirolab.

8.3.5 QAQC conclusion

The overall assessment of the data quality is as follows:

- All samples were analysed within recommended holding times;
- Field observations and measurements were generally comparable to laboratory data;
- The dataset as a whole is considered reliable.

9 POTENTIAL FOR CONTAMINATION AND CONCEPTUAL SITE MODEL

9.1 Introduction

A key component of the investigation/ risk assessment process is the development of a Conceptual Site Model (CSM) as this drives the risk management and remediation process. This identifies potential sources of contamination, potential migration pathways along which identified contaminants could migrate and potential receptors which may become exposed.

The CSM considers all plausible pollutant linkages associated with the identified contamination. By evaluating these linkages proposed controls can be outlined and recommendations developed for appropriate remediation or management.

9.2 Sources of contamination

Bonded ACM located in two areas of site potentially from:

- Incomplete disposal of historic building rubble in the northern portion of site; and
- Uncontrolled fill located in the south-western corner of site.

9.3 Contaminants of potential concern

Asbestos fragments in the form of bonded ACM and fibres.

9.4 Pathways

Inhalation of free fibres after breaking of bonded fragments.

9.5 Receptors

Current and future onsite workers / visitors, and offsite residents / visitors.

9.6 Source to receptors linkages

Based upon results and findings of this assessment, a source-pathway-receptor risk-linkage analysis is presented in **Table 13**.

Table 13: Source pathway receptor analysis

Contaminating Source / Activity	Pathway	Receptor	Risk	Notes
ACM within stockpiled fill material in the northern portion of site.	Inhalation of fibres	Human – Current and future onsite workers and visitors.	Moderate 1	Bonded asbestos is not considered a direct risk to human health unless crushed by plant machinery and broken to release fibres into the air. The northern portion of site is also currently fenced off from the public so is not considered a major risk to human receptors. However, any materials movement and/or construction to occur in this area, the asbestos impact must be managed.
ACM within shallow soils in the south-western corner of site			Moderate 1	Bonded asbestos is not considered a direct risk to human health unless crushed by plant machinery and broken to release fibres into the air. Shallow soils are impacted and exceeding adopted guidelines for proposed site land uses. Any mechanical movement and/or construction planned in this area will need to be managed for asbestos impact.

Notes:

HIGH RISK - desktop review and site inspection have identified potentially contaminating site activities and intrusive works must be carried out to remediate.

MODERATE RISK - desktop review and site inspection cannot rule out the presence of potentially contaminating site activities without undertaking recommended intrusive works

MODERATE 1 - potential for contamination is limited in either likelihood or extent and the presence or absence of contamination is expected to be resolved by limited targeted sampling

MODERATE 2 - potential for contamination is greater or more extensive than Moderate 1 and will require further delineation of contamination and remediation.

LOW RISK - desktop review and site inspection have not identified any potentially contaminating site activities.

10 CONCLUSION

Environmental Earth Sciences was commissioned by Frasers to undertake a DSI for Stage 1A as part of a redevelopment within the suburb of Telopea with the purpose of providing supporting documentation for the detailed development application (DA) to progress the proposed Telopea Master Plan.

Based upon the desktop study, site walkover, intrusive investigation and laboratory analysis the following contaminated site features were observed:

- ACM located on the ground surface and within stockpiled fill material in the northern fenced off area of site. Building rubble located here is potentially from the incomplete management and demolition of two historic buildings noted in aerial photographs.
- Poor quality fill including the presence of bonded ACM in the south-western corner of site up to 0.5 m depth (ID: 12).

Environmental Earth Sciences consider there to be a **Moderate 1** risk to human receptors in identified areas of the site due to bonded asbestos present both on the ground surface and within shallow soils.

It is recommended that prior to the proposed development works, surficial ACMs be removed by a suitably licensed contractor. As part of the development works, the poor quality fill material in southwest of the site area will require excavation and assessed for either onsite reuse or offsite disposal. Following the removal of these ACMs, the land would be considered **Low Risk** and suitable for the proposed low density residential, high density residential and recreational, open space land use.

11 RECOMMENDATIONS

Environmental Earth Sciences does not envisage that further detailed environmental assessment is required to delineate identified contamination, however it is recommended that an Asbestos Management Plan (AMP) is prepared for the removal of the ACM impacted fill material in both the northern portion of site and the south-western corner. Following this an inspection and validation of surrounding residual soils prior to development works to ensure bonded fragments are removed from both areas.

It is recommended that the Asbestos Management Plan (AMP) is prepared with reference to the WorkCover NSW Code of Practice (2014) *“Managing asbestos in or on soil”* and Appendix E of WA health’s (2009) *“guidelines for the assessment, remediation and*

management of asbestos -contaminated site in Western Australia” and will document procedures for clearance and validation of asbestos remediation at site.

The AMP should be followed by all contractors during redevelopment. Asbestos removal should be undertaken by a Class A licenced asbestos removalist. ACM fragments are to be disposed to a licensed waste facility that can accept Special Waste (Asbestos).

There is a potential for unexpected subsurface finds (as is the case for any site), and consequently Environmental Earth Sciences recommends that management procedures be implemented to for:

- Procedures for soil disposal and waste classification in accordance with NSW EPA (2014) - *Waste Classification Guidelines*;
- Unexpected Findings Protocol (UFP) procedure for managing instances where gross contamination and/or hazardous materials are encountered, with appropriate consideration of WH&S controls for mitigating risk to construction workers.

12 LIMITATIONS

This report has been prepared by Environmental Earth Sciences NSW ACN 109 404 006 in response to and subject to the following limitations:

1. The specific instructions received from Frasers Property Australia;
2. The specific scope of works set out in PO120047_V1 (dated 11 March 2020) issued by Environmental Earth Sciences for and on behalf of Frasers Property Australia;
3. May not be relied upon by any third party not named in this report for any purpose except with the prior written consent of Environmental Earth Sciences NSW (which consent may or may not be given at the discretion of Environmental Earth Sciences NSW);
4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;
5. The report only relates to the site referred to in the Introduction and Figure 2 being located at 14 Sturt Street, Telopea NSW (Lots 5 – 7 DP 128229) (“the site”);
6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;
7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report;
8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill, excavated natural material (ENM) or virgin excavated natural material (VENM) if deposited off site;
9. This report is not a geotechnical or planning report suitable for planning or zoning purposes; and
10. Our General Limitations set out at the back of the body of this report.

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ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences NSW. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

Obtain regulatory approval

The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

Limit of liability


This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences NSW disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences NSW disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences NSW's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

FIGURES





 ENVIRONMENTAL EARTH SCIENCES CONTAMINATION RESOLVED	Drawn by: NE	Date: April 2020	Frasers Property Stage 1A - Polding Place, Telopea NSW	Site Features and Sampling Locations	Figure No. 2
	Proj. Manager: LL	Scale: As shown			
	Job No: 120034	Source: Nearmaps			

APPENDIX A: PASS RISK MAP



Parramatta Local Environmental Plan 2011

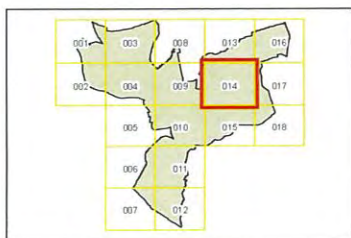
Acid Sulfate Soils Map - Sheet ASS_014

Acid Sulfate Soils

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5

Cadastre

Cadastre 27/05/2011 © Parramatta City Council



0 200 400 Metres

Scale 1:10,000 @ A3

Projection: GDA 1994
MGA Zone 56

Map identification number:

6250_COM_ASS_014_010_20110601



APPENDIX B: HISTORICAL AERIAL IMAGERY



HISTORICAL AERIAL PHOTOGRAPH - 1943





HISTORICAL AERIAL PHOTOGRAPH - 1955





HISTORICAL AERIAL PHOTOGRAPH - 1965





HISTORICAL AERIAL PHOTOGRAPH - 1971





HISTORICAL AERIAL PHOTOGRAPH - 1975





HISTORICAL AERIAL PHOTOGRAPH - 1986





HISTORICAL AERIAL PHOTOGRAPH - 1991





HISTORICAL AERIAL PHOTOGRAPH - 1994





HISTORICAL AERIAL PHOTOGRAPH - 2004





HISTORICAL AERIAL PHOTOGRAPH - 2007







HISTORICAL AERIAL PHOTOGRAPH - 2014





HISTORICAL AERIAL PHOTOGRAPH - 2020



APPENDIX C: PHOTO PLATES

Plate 1 – South-eastern portion of site (facing south)



Plate 2 – Southern border of site, behind Polding Place buildings (facing east)



Plate 3 – Large grassed area located in the central portion of site, noting grass covered stockpiles in the rear (facing east)



Plate 4 – Landscaped grass covered stockpiles located in the center of site (facing west)



Plate 5 – PACM located in borehole location 12



Plate 6 – Fill material located in the northern fenced off area of site mostly behind a brick wall



Plate 7 – Stockpiled material in the northern fenced off area of site.



Plate 8 – PACM4 located on the stockpiles surface in the northern fenced off



Plate 9 – Northern boundary of site in the vicinity of borehole location 28



Plate 10 – Typical soil profile noted onsite.



APPENDIX D: BORELOGS

Geological Borelog

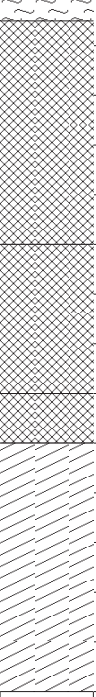
LOCATION: Teloepa		Borehole Log: BH1	Logged by: ZZ
SURFACE ELEVATION:	JOB NUMBER: 119095		
GROUNDWATER:	DATUM:	PROJECT: Teloepa	Proj. Manager: LL
DRILL METHOD: Hand auger/Push tube	DATE DRILLED: 14 Oct 2019		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
Turf and grass							
FILL Rework natural, loose sandy loamy CLAY		0.2			1.1		
FILL Reworked natural, orange firm CLAY		0.4					
FILL Reworked natural, loose dark brown loamy CLAY Inclusion of charcoal and coal		0.8					
FILL Stiff orange CLAY mottled with brown clay and ash		1.0					
Natural Orange Stiff CLAY		1.2					Start push tubing from 1.2 mBGL
		1.4					
		1.6					
		1.8					
		2.0					
EOH End of hole reached at 2.4 mBGL		2.4					
		2.6					
		2.8					
		3.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

LOCATION: Telopea		Borehole Log: BH2	Logged by: ZZ
SURFACE ELEVATION:	JOB NUMBER: 119095		
GROUNDWATER:	DATUM:	PROJECT: Telopea	Proj. Manager: LL
DRILL METHOD: Hand auger	DATE DRILLED: 14 Oct 2019		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
Turf and grass		0.2	■		1.1		
FILL Rework natural, Stiff orange CLAY with red and grey mottling, ash (1%), ironstone (1%)		0.4					
FILL Reworked natural, soft dark brown loamy CLAY		0.6	■				
FILL Reworked natural, soft dark brown loamy CLAY becoming red and more clayey		0.8	■				
Natural Firm red CLAY		1.0	■				
Becoming mottled orange/ yellow and more stiff		1.2					
		1.4	■				
EOH Target depth reached at 1.4 mBGL		1.6					
		1.8					
		2.0					
		2.2					
		2.4					
		2.6					
		2.8					
		3.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

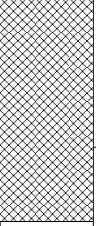
LOCATION: Telopea		Borehole Log: BH3	Logged by: ZZ
SURFACE ELEVATION:	JOB NUMBER: 119095		
GROUNDWATER:	DATUM:	PROJECT: Telopea	Proj. Manager: LL
DRILL METHOD: Hand auger	DATE DRILLED: 14 Oct 2019		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
Turf and grass		0.0					
FILL Reworked natural orange CLAY		0.2			1.1		Slight sweet odour
FILL Rework natural, loose dark brown clayey Loam		0.4					No visual/ olfactory but slight ash noted at 0.5 mBGL
Natural Stiff orange/ red CLAY with rootlets (5%), wood(2%) and organic matter (2%)		0.6					
Becoming mottled grey/ yellow		0.8					
EOH Target depth reached at 1.0 mBGL		1.0					
		1.2					
		1.4					
		1.6					
		1.8					
		2.0					
		2.2					
		2.4					
		2.6					
		2.8					
		3.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

LOCATION: Teloepa		Borehole Log: HA1	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Soft dark brown CLAY							
NATURAL Stiff light brown/ red CLAY		0.2					
							1/0.25-0.35 (FD1)
EOH - REFUSAL ON STIFF CLAY		0.4					
		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog



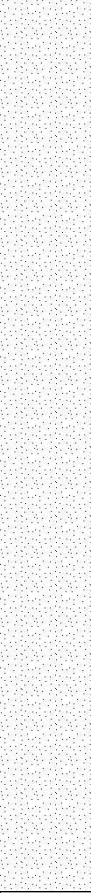
LOCATION: Teloepa		Borehole Log: HA2	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Brown CLAY		0.2					2/0.15-0.25
EOH - NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

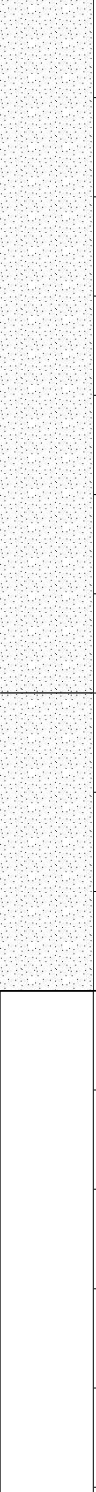
LOCATION: Teloepa		Borehole Log: HA3	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark brown CLAY with gravel		0.2					3/0.1-0.2
EOH - REFUSAL		0.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

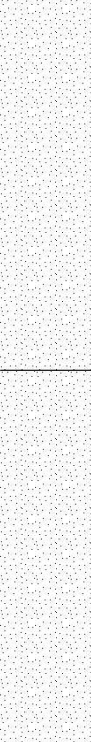

LOCATION: Telopea		Borehole Log: HA4	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers telopea DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark / brown CLAY		0.2					4/0.4-0.5
		0.4					
		0.6					
NATURAL Orange / brown CLAY		0.8					4/0.7-0.9
		1.0					
		1.2					
EOH NATURAL		1.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog



LOCATION: Teloepa		Borehole Log: HA5	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark / brown CLAY		0.2					5/0.3-0.5 (anthropogenic material on surface, No ACM)
NATURAL Orange / brown CLAY		0.4					
EOH NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

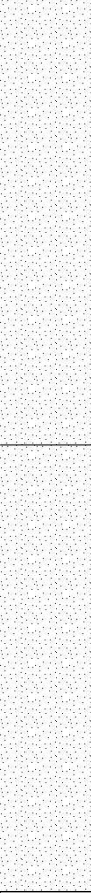

LOCATION: Teloepa		Borehole Log: HA6	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Soft dark brown CLAY		0.2					6/0.3-0.4
NATURAL Firm red / brown CLAY							
EOH - REFUSAL ON STIFF CLAY		0.4					
		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog


LOCATION: Teloepa		Borehole Log: HA7	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Soft dark / brown CLAY		0.2					7/0.1-0.2
NATURAL Firm red / brown CLAY							
EOH NATURAL		0.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

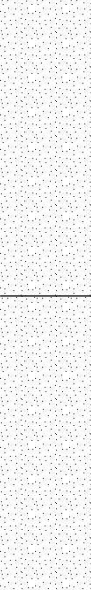
LOCATION: Teloepa		Borehole Log: HA8	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark / brown CLAY		0.2					8/0.2-0.3
NATURAL Orange / brown CLAY		0.4					
EOH NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

LOCATION: Teloepa		Borehole Log: HA9	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

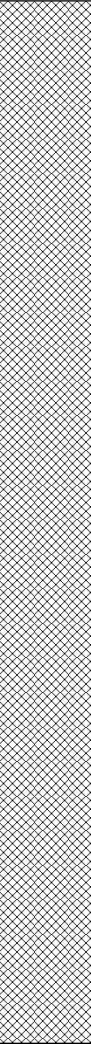

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark / brown CLAY		0.2					
NATURAL Orange / brown CLAY with rootlets		0.4					9/0.2-0.4
EOH NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog



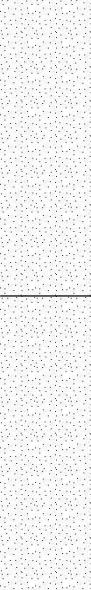
LOCATION: Teloepa		Borehole Log: HA10	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Firm dark / brown CLAY with red / grey / orange clay inclusions with bricks, tile fragments, white tile, grey bricks, glass fragments		0.2 0.4 0.6					10/0.4-0.5
EOH REFUSAL		0.8 1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

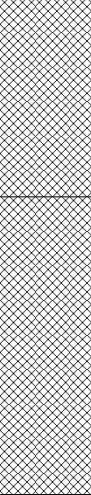
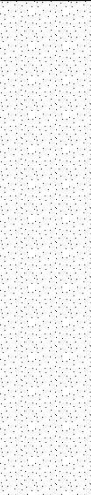
LOCATION: Teloepa		Borehole Log: HA11	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark brown CLAY		0.2					11/0.2-0.3
NATURAL Orange / brown CLAY		0.4					
EOH		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

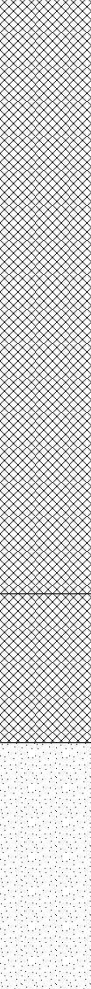
LOCATION: Teloepa		Borehole Log: HA12	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
REWORKED NATURAL Brown / orange CLAY with shale inclusions		0.2					
REWORKED NATURAL Dark brown CLAY with PACM		0.4					PACM 1 12/0.2-0.4
NATURAL Orange / brown CLAY with rootlets		0.6					
		0.8					
		1.0					
EOH		1.2					
		1.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

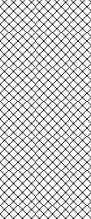

LOCATION: Teloepa		Borehole Log: HA13	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown CLAY with red clay inclusions and yellow tiles / rocks		0.2					13/0.4-0.5
		0.4					
		0.6					
FILL Orange / brown CLAY							
NATURAL Red CLAY		0.8					
		1.0					
EOH NATURAL							
		1.2					
		1.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog


LOCATION: Teloepa		Borehole Log: HA14	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown CLAY with gravels							14/0.3-0.5
REWORKED NATURAL Orange / brown CLAY		0.2					
REWORKED NATURAL Dark brown CLAY		0.4					
		0.6					
NATURAL Orange / brown CLAY with rootlets		0.8					
EOH NATURAL		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

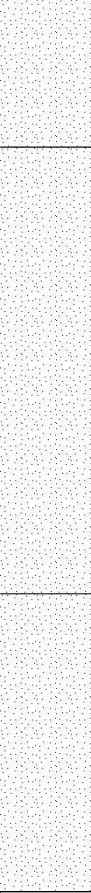
LOCATION: Teloepa		Borehole Log: HA24	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown CLAY		0.2					24/0.1-0.3
REWORKED NATURAL Red / brown CLAY with grey / orange mottling		0.4					PACM 1
NATURAL Stiff red CLAY		0.6					
EOH		1.0					
		1.2					
		1.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

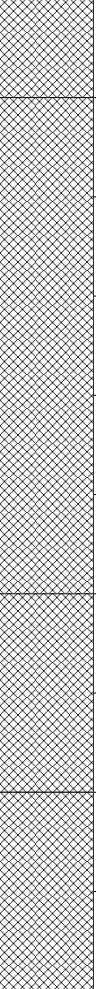
LOCATION: Telopea		Borehole Log: HA16	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers telopea DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Dark brown CLAY							
NATURAL Red / yellow / brown CLAY		0.2					16/0.2-0.4
NATURAL Light grey CLAY with red / brown mottling		0.4					
EOH NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

LOCATION: Telopea		Borehole Log: HA17	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers telopea DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

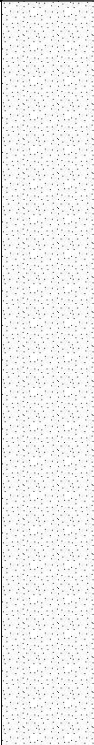

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Dark brown CLAY							17/0.3-0.5
FILL Brown / grey CLAY with gravel		0.2					
FILL Light brown / grey CLAY		0.4					
FILL Grey sandy CLAY with gravel		0.6					
EOH		0.8					
		1.0					
		1.2					
		1.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog



LOCATION: Teloepa		Borehole Log: HA18	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

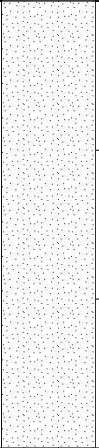
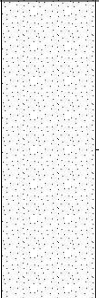
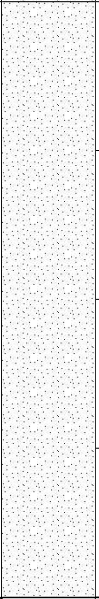
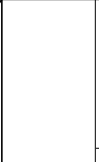
STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Brown red CLAY		0.2 0.4					18/0.2-0.3
EOH NATURAL		0.6 0.8 1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog



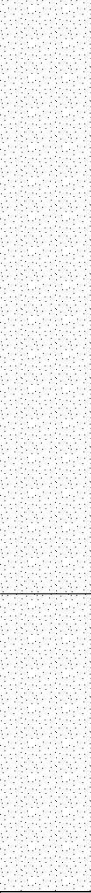
LOCATION: Teloepa		Borehole Log: HA19	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Orange / red / brown / grey CLAY		0.2					19/0.2-0.4
NATURAL Dark brown CLAY with rootlets		0.4					
NATURAL Red / brown CLAY		0.6 0.8					
EOH NATURAL		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog


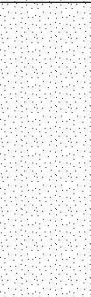

LOCATION: Telopea		Borehole Log: HA20	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers telopea DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Brown CLAY with anthropogenic waste, old electrical wire		0.2					20/0.2-0.4
NATURAL Red / brown CLAY		0.4					
EOH NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

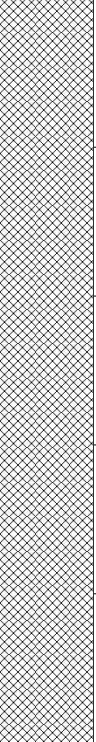


LOCATION: Teloepa		Borehole Log: HA21	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
NATURAL Brown CLAY with sand gravel		0.2					21/0.2-0.4 (FD2)
		0.4					
NATURAL Brown red CLAY		0.6					
		0.8					
EOH NATURAL		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

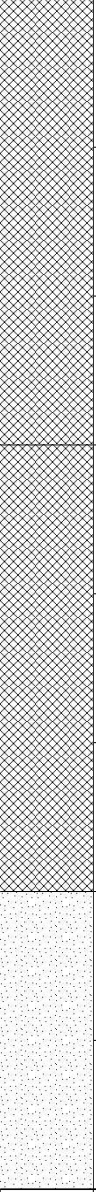
LOCATION: Teloepa		Borehole Log: HA22	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Dark brown CLAY with shale		0.2 0.4					22/0.3-0.4
NATURAL Red / brown CLAY with rootlets		0.6					
EOH NATURAL		0.8 1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

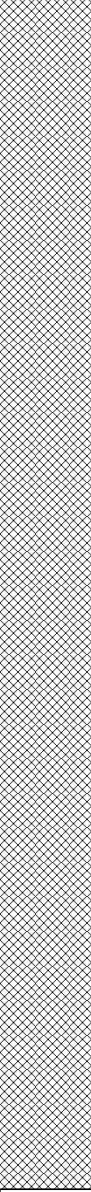

LOCATION: Teloepa		Borehole Log: HA23	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown sandy CLAY		0.2					23/0.4-0.5
FILL Brown CLAY with brick cobbles		0.4					
NATURAL Red / brown CLAY		0.6					
EOH NATURAL		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

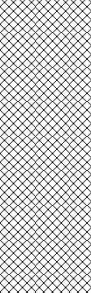
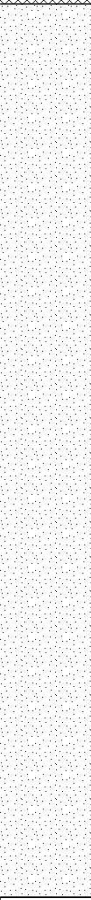
LOCATION: Teloepa		Borehole Log: HA24	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown CLAY with bricks, concrete cobbles, glass fragments and PACM		0.2					24/0.1-0.3
		0.4					PACM 1
		0.6					
		0.8					
		1.0					
		1.2					
		1.4					
		1.6					
		1.8					
		2.0					
EOH REFUSAL		2.2					
		2.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

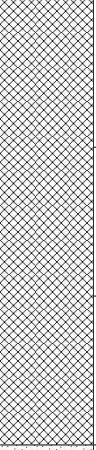

LOCATION: Teloepa		Borehole Log: HA25	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown sandy CLAY with rootlets and concrete gravel		0.2					25/0.1-0.2
NATURAL Red / orange CLAY		0.4					
		0.6					
		0.8					
EOH NATURAL		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

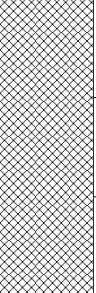


LOCATION: Teloepa		Borehole Log: HA26	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Dark brown CLAY with concrete gravel		0.2					PACM2
NATURAL Red / brown CLAY		0.4					26/0.2-0.4
EOH NATURAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

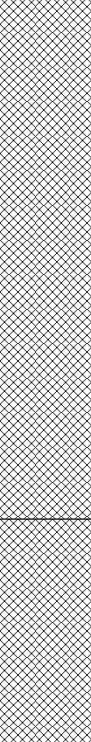
LOCATION: Teloepa		Borehole Log: HA27	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown sandy CLAY with rootlets and concrete gravel		0.2					
NATURAL Dark brown CLAY with rootlets		0.4 0.6 0.8 1.0				27/0.3-0.5	
EOH NATURAL		1.2 1.4					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

Geological Borelog

LOCATION: Teloepa		Borehole Log: HA28	Logged by: NE / LL
SURFACE ELEVATION:	JOB NUMBER: 120034		
GROUNDWATER:	DATUM:	PROJECT: Frasers teloepa DSI	Proj. Manager: JB
DRILL METHOD: Hand auger	DATE DRILLED: 06/04/2020		

STRATIGRAPHY	GRAPHIC LOG	Depth (metres)	Sample Depth	Sample ID	PID (ppm)	Moisture Content	Comments
FILL Brown sandy CLAY		0.2					28/0.25-0.35
FILL Red / brown sandy CLAY with road base gravel		0.4					
EOH REFUSAL		0.6					
		0.8					
		1.0					

NOTE: This bore log is for environmental purposes only and is not intended to provide geotechnical information.

APPENDIX E: RESULTS SUMMARY TABLES

 ENVIRONMENTAL EARTH
SCIENCES
CONTAMINATION RESOLVED®

		HLS				EILs	CONTAMINATION RESOLVED																					
Sample ID	NEPM 2013 Table 1A(1) HLS Res A Soil	NEPM 2013 Table 1A(1) HLS Res B Soil	NEPM 2013 Table 1A(1) HLS Rec C Soil	NEPM 2013 Schedule 5bC EILs Rec C and Open Space	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		
Sample Depth (m)	0.25-0.35	0.15-0.25	0.1-0.2	0.4-0.5	0.3-0.5	0.3-0.4	0.1-0.2	0.2-0.3	0.2-0.4	0.4-0.5	0.2-0.3	0.2-0.4	0.4-0.5	0.3-0.5	0.3-0.4	0.2-0.4	0.3-0.5	0.2-0.3	0.2-0.4	0.2-0.4	0.3-0.5	0.2-0.3	0.2-0.4	0.2-0.4	0.2-0.4	0.3-0.4		
Date	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020		
Units	LOR																											
BTEX																												
Benzene	mg/kg	0.5			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
Toluene	mg/kg	0.2			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Ethylbenzene	mg/kg	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Xylene (m & p)	mg/kg	2			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
Xylene (o)	mg/kg	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Naphthalene	mg/kg	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Xylene Total	mg/kg	3			<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3		
Metals																												
Lead	mg/kg	1	300	1200	600	1100	31	31	55	81	81	25	37	59	18	27	32	19	18	26	24	14	15	15	20	17	19	87
Arsenic	mg/kg	4	100	500	300	100	7	9	9	15	14	9	6	8	6	5	7	7	5	6	6	8	6	7	7	7	6	7
Cadmium	mg/kg	0.4	20	150	90		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	
Chromium (III+VI)	mg/kg	1			190	16	15	17	20	22	17	13	17	18	16	14	18	17	17	17	14	12	22	19	25	16	19	
Copper	mg/kg	1	6000	30000	17000	60	16	20	24	24	17	18	24	18	13	16	15	10	13	15	12	15	9	11	9	12	17	
Mercury	mg/kg	0.1	40	120	80		<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2		
Nickel	mg/kg	1	400	1200	1200	30	5	5	6	7	13	3	6	5	5	4	4	2	3	2	5	3	5	2	1	3	6	
Zinc	mg/kg	1	7400	60000	30000	70	28	42	100	100	99	16	39	57	20	33	92	6	9	17	16	22	17	9	5	6	19	
PAH/Phenols																												
Benz(a,b,h)fluoranthene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
Acenaphthene	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Benz[a]anthracene	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Benzo[a]pyrene	mg/kg	0.1	3	4	3		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Benzo[g,h,i]perylene	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Dibenz(a,h)anthracene	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Indeno[1,2,3-c,d]pyrene	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0								

NOTES:

LOR

mg/kg

HIL
CU

EIL

Laboratory limit of reporting

Miligrams per kilogram

Health investigation Level (A - Residential low density, B - Residential high density, C- Open space / recreation)
Ecological Investigation Level

Land use criteria adopted from ASC NEPM (2013)

and use criteria adopted from ASC NCM (2015)

 ENVIRONMENTAL EARTH
SCIENCES
CONTAMINATION RESOLVED

		HILS			EILs											
Sample ID		NPEM 2013 Table 1A(1) HILs Res A Soil	NPEM 2013 Table 1A(1) HILs Res B Soil	NPEM 2013 Table 1A(1) HILs Rec C Soil	NPEM 2013 Schedule Sbc EILs Res and Open Space	23	24	25	26	27	28	BH1	BH1	BH2	BH3	BH3
	Sample Depth (m) Date					0.4-0.5	0.1-0.3	0.1-0.2	0.2-0.4	0.3-0.5	0.25-0.35	0.2-0.3	0.9-1.0	0.2-0.3	0.2-0.3	0.4-0.5
	Units					6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	6/04/2020	14/10/2019	14/10/2019	14/10/2019	14/10/2019	14/10/2019
LOR																
BTEX																
Benzene	mg/kg	0.2				<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	1				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (m & p)	mg/kg	2				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Xylene (o)	mg/kg	1				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	mg/kg	1			170	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene Total	mg/kg	3				<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Metals																
Lead	mg/kg	1	300	1200	600	1100	21	17	15	50	20	23	21	22	24	28
Arsenic	mg/kg	4	100	500	300	100	6	8	6	9	6	4	6	8	8	9
Cadmium	mg/kg	0.4	20	150	90		<0.4	<0.4	<0.4	<0.4	<0.4	<1	<1	<1	<1	<1
Chromium (III+VI)	mg/kg	1				190	31	10	24	17	17	19	14	28	17	29
Copper	mg/kg	1	6000	30000	17000	60	8	36	4	23	13	10	13	12	14	16
Mercury	mg/kg	0.1	40	120	80		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	400	1200	1200	30	5	38	2	3	5	13	4	3	5	<2
Zinc	mg/kg	1	7400	60000	30000	70	13	36	4	79	14	14	16	6	17	<5
PAH/Phenols																
Benzo(b)fluoranthene	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.05	3				<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.1		4	3		<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
DiBenzo(a,h)anthracene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.1					<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.5	<0.5	<0.5	0.9
Fluorene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.1				170	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.05	300	400	300		<0.05	<0.05	<0.05	0.3	<0.05	0.2	<0.5	<0.5	<0.5	2.4
Phenanthrene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	0.7
Pyrene	mg/kg	0.1					<0.1	<0.1	<0.1	0.1	<0.1	<0.5	<0.5	<0.5	<0.5	0.8
TPH																
C6 - C9	mg/kg	25					<25	<25	<25	<25	<25	<25	<50	<50	<50	<50
C6-C10	mg/kg	25					<25	<25	<25	<25	<25	<25	<50	<50	<50	<50
C10-C16	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C18-C34	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C34-C40	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10 - C14	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29-C36	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10 - C40 (Sum of total)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Organochlorine Pesticides																
alpha-BHC	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
gamma-BHC	mg/kg	0.1	10	15	10		-	<0.1	-	-	-	<0.1	-	-	-	-
delta-BHC	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
gamma-BHC	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Heptachlor	mg/kg	0.1	6	10	10		-	<0.1	-	-	-	<0.1	-	-	-	-
delta-BHC	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Aldrin	mg/kg	0.1	6	10	10		-	<0.1	-	-	-	<0.1	-	-	-	-
Heptachlor Epoxide	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
gamma-Chlordane	mg/kg	0.1	50	80	70		-	<0.1	-	-	-	<0.1	-	-	-	-
alpha-Chlordane	mg/kg	0.1	50	90	70		-	<0.1	-	-	-	<0.1	-	-	-	-
Endosulfan I	mg/kg	0.1	270	400	340		-	<0.1	-	-	-	<0.1	-	-	-	-
pp-DDE	mg/kg	0.1					-	0.2	-	-	-	<0.1	-	-	-	-
Dieldrin	mg/kg	0.1	6	10	10		-	<0.1	-	-	-	<0.1	-	-	-	-
Endrin	mg/kg	0.1	10	20	20		-	<0.1	-	-	-	<0.1	-	-	-	-
Endosulfan II	mg/kg	0.1	270	400	340		-	<0.1	-	-	-	<0.1	-	-	-	-
pp-DDD	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Endrin Aldehyde	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
pp-DDT	mg/kg	0.1				180	-	<0.1	-	-	-	<0.1	-	-	-	-
Endosulfan Sulphate	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Methoxychlor	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Total +ve DDT+DDD+DDO	mg/kg	0.1	240	600	400		-	0.2	-	-	-	<0.1	-	-	-	-
Herbicides																
Dichlorvos	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Dimethoate	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Diazinon	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Ronnel	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Fenitrothion	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Malathion	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Chlorfenvinphos	mg/kg	0.1	160	340	250		-	<0.1	-	-	-	<0.1	-	-	-	-
Parathion	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Bromophos-ethyl	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Ethion	mg/kg	0.1					-	<0.1	-	-	-	<0.1	-	-	-	-
Azinphos-methyl (Guthion)	mg/kg	0.1					-	0.2	-	-	-	<0.1	-	-	-	-
Inorganic																
Moisture Content	%	1					21	8.5	19	23	22	12	20.2	27.6	18.2	21.5
																23

NOTES:
LOR

Laboratory limit of reporting

Miligrams per kilogram

Health investigation level (A - Residential low density, B - Residential high density)

Ecological Investigation Level

and use criteria adopted from ASC NCM (2015)

TABLE B - Asbestos results

Sample ID	Sample Depth (m)	Sample date	Asbestos present	Matrix	Inclusions / description
1	0.25-0.35	6/04/2020	NO	Clayish Sandy soil	Stones, wood chips and plant matter
3	0.1-0.2	6/04/2020	NO	Clayish Sandy soil	Stones, wood chips and plant matter
5	0.3-0.5	6/04/2020	NO	Clayish Sandy soil	Stones, wood chips and plant matter
6	0.3-0.4	6/04/2020	NO	Clayish Sandy soil	Stones, wood chips and plant matter
9	0.2-0.4	6/04/2020	NO	Clayish Sandy soil	Stones, charcoal and plant matter
10	0.4	6/04/2020	NO	Clayish Sandy soil	Stones, wood chips, plant matter and fragments of cement, brick and ceramic tile
11	0.2-0.3	6/04/2020	NO	Clayish Sandy soil	Stones, shale, plant matter and fragments of glass.
12	0.2-0.4	6/04/2020	ACM - Ch, Am, Cr	Clayish Sandy soil	Stones, wood chips, plant matter and fragments of fibre cement (ACM)
15	0.3-0.4	6/04/2020	NO	Clayish Sandy soil	Stones, charcoal and plant matter
17	0.3-0.5	6/04/2020	NO	Clayish Sandy soil	Stones, charcoal, shale and plant matter
18	0.2-0.3	6/04/2020	NO	Clayish Sandy soil	Stones, charcoal, plant matter and fragments of plastic and metal
19	0.2-0.4	6/04/2020	NO	Clayish Sandy soil	Stones, charcoal and plant matter
24	0.1-0.3	6/04/2020	NO	Clayish Sandy soil	Stones, wood chips, plant matter and fragments of cement and brick
27	0.3-0.5	6/04/2020	NO	Clayish Sandy soil	Stones, charcoal and plant matter
PACM-1	Surface	6/04/2020	ACM - Ch, Am, Cr	Fragment	A fragment of fibre cement material
PACM-2	Surface	6/04/2020	ACM - Ch	Fragment	A fragment of fibre plaster cement material containing organic fibres
PACM-3	Surface	6/04/2020	ACM - Ch	Fragment	A fragment of fibre plaster cement material containing organic fibres
PACM-4	Surface	6/04/2020	ACM - Ch, Am, Cr	Fragment	A fragment of fibre cement material
BH1	0.2-0.3	14/10/2019	NO	Mid brown soil	-
BH3	0.2-0.3	14/10/2019	NO	Mid brown soil	-

Notes:

Ch	Chrysotile Asbestos
Am	Amosite Asbestos
Cr	Crocidolite Asbestos
FA	Friable Asbestos
AF	Asbestos Fines
ACM	Asbestos Containing Material
NO	No asbestos present in any form

Table C - Field Duplicate RPDs

Sample ID Sample Depth (m) Date Sample type				1	FD1	RPD (%)	21	FD2	RPD (%)
				0.25-0.35	-		0.2-0.4	-	
				06/04/2020	06/04/2020		06/04/2020	06/04/2020	
				Primary	Duplicate		Primary	Duplicate	
Units			LOR						
BTEx									
	Benzene	mg/kg	0.2	<0.2	<0.2	NC	<0.2	<0.2	NC
	Toluene	mg/kg	0.5	<0.5	<0.5	NC	<0.5	<0.5	NC
	Ethylbenzene	mg/kg	1	<1	<1	NC	<1	<1	NC
	Xylene (m & p)	mg/kg	2	<2	<2	NC	<2	<2	NC
	Xylene (o)	mg/kg	1	<1	<1	NC	<1	<1	NC
	Naphthalene	mg/kg	1	<1	<1	NC	<1	<1	NC
	Xylene Total	mg/kg	3	<3	<3	NC	<3	<3	NC
Metals									
	Lead	mg/kg	1	31	32	3.17	19	18	5.41
	Arsenic	mg/kg	4	7	8	13.33	6	6	0.00
	Cadmium	mg/kg	0.4	<0.4	<0.4	NC	<0.4	<0.4	NC
	Chromium (III+VI)	mg/kg	1	16	15	6.45	16	20	22.22
	Copper	mg/kg	1	16	19	17.14	12	7	52.63
	Mercury	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Nickel	mg/kg	1	5	5	0.00	6	3	66.67
	Zinc	mg/kg	1	28	31	10.17	19	11	53.33
PAH/Phenols									
	Benzo(b+j+k)fluoranthene	mg/kg	0.2	<0.2	<0.2	NC	<0.2	<0.2	NC
	Acenaphthene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Acenaphthylene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Anthracene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Benz(a)anthracene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Benzo(a) pyrene	mg/kg	0.05	<0.05	<0.05	NC	<0.05	<0.05	NC
	Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Chrysene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Fluoranthene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Fluorene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Naphthalene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	PAHs (Sum of total)	mg/kg	0.05	<0.05	<0.05	NC	<0.05	<0.05	NC
	Phenanthrene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
	Pyrene	mg/kg	0.1	<0.1	<0.1	NC	<0.1	<0.1	NC
TPH									
	C6 - C9	mg/kg	25	<25	<25	NC	<25	<25	NC
	C6-C10	mg/kg	25	<25	<25	NC	<25	<25	NC
	C10-C16	mg/kg	50	<50	<50	NC	<50	<50	NC
	C16-C34	mg/kg	100	<100	<100	NC	<100	<100	NC
	C34-C40	mg/kg	100	<100	<100	NC	<100	<100	NC
	C10 - C14	mg/kg	50	<50	<50	NC	<50	<50	NC
	C15 - C28	mg/kg	100	<100	<100	NC	<100	<100	NC
	C29-C36	mg/kg	100	<100	<100	NC	<100	<100	NC
	C10 - C40 (Sum of total)	mg/kg	50	<50	<50	NC	<50	<50	NC

NOTES:

RPDs have only been considered where a concentration is greater than 1 times the EQL.

High RPDs are in red (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))

NC: Not Calculated

LOR - Laboratory limit of reporting

mg/kg - Milligrams per kilogram

Table C - Field Duplicate RPDs



		Sample ID	1	FD1	RPD (%)
		Sample Depth (m)	0.25-0.35	-	
		Date	06/04/2020	06/04/2020	
		Sample type	Primary	Duplicate	
Units	LOR				
BTEX					
Benzene	mg/kg	0.2	<0.2	<0.2	NC
Toluene	mg/kg	0.5	<0.5	<0.5	NC
Ethylbenzene	mg/kg	1	<1	<1	NC
Xylene (m & p)	mg/kg	2	<2	<2	NC
Xylene (o)	mg/kg	1	<1	<1	NC
Naphthalene	mg/kg	1	<1	<1	NC
Xylene Total	mg/kg	3	<3	<3	NC
Metals					
Lead	mg/kg	1	31	32	3.17
Arsenic	mg/kg	4	7	8	13.33
Cadmium	mg/kg	0.4	<0.4	<0.4	NC
Chromium (III+VI)	mg/kg	1	16	15	6.45
Copper	mg/kg	1	16	19	17.14
Mercury	mg/kg	0.1	<0.1	<0.1	NC
Nickel	mg/kg	1	5	5	0.00
Zinc	mg/kg	1	28	31	10.17
PAH/Phenols					
Benzo(b+j+k)fluoranthene	mg/kg	0.2	<0.2	<0.2	NC
Acenaphthene	mg/kg	0.1	<0.1	<0.1	NC
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	NC
Anthracene	mg/kg	0.1	<0.1	<0.1	NC
Benz(a)anthracene	mg/kg	0.1	<0.1	<0.1	NC
Benzo(a) pyrene	mg/kg	0.05	<0.05	<0.05	NC
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	NC
Chrysene	mg/kg	0.1	<0.1	<0.1	NC
Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	NC
Fluoranthene	mg/kg	0.1	<0.1	<0.1	NC
Fluorene	mg/kg	0.1	<0.1	<0.1	NC
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	NC
Naphthalene	mg/kg	0.1	<0.1	<0.1	NC
PAHs (Sum of total)	mg/kg	0.05	<0.05	<0.05	NC
Phenanthrene	mg/kg	0.1	<0.1	<0.1	NC
Pyrene	mg/kg	0.1	<0.1	<0.1	NC
TPH					
C6 - C9	mg/kg	25	<25	<25	NC
C6-C10	mg/kg	25	<25	<25	NC
C10-C16	mg/kg	50	<50	<50	NC
C16-C34	mg/kg	100	<100	<100	NC
C34-C40	mg/kg	100	<100	<100	NC
C10 - C14	mg/kg	50	<50	<50	NC
C15 - C28	mg/kg	100	<100	<100	NC
C29-C36	mg/kg	100	<100	<100	NC
C10 - C40 (Sum of total)	mg/kg	50	<50	<50	NC

NOTES:

RPDs have only been considered where a concentration is greater than 1 times the EQL.

High RPDs are in red (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (>

NC: Not Calculated

LOR - Laboratory limit of reporting

mg/kg - Miligrams per kilogram

APPENDIX F: LABORATORY TRANSCRIPTS AND CHAIN OF CUSTODY DOCUMENTATION

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental & Earth Sciences
Attention	Linda Lenihan

Sample Login Details

Your reference	120034, Telopea
Envirolab Reference	240507
Date Sample Received	07/04/2020
Date Instructions Received	07/04/2020
Date Results Expected to be Reported	16/04/2020

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	33 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	1.8
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	Acid Extractable metals in soil	On Hold
1/0.25-0.35 m	✓	✓	✓			✓	
2/0.15-0.25 m	✓	✓	✓			✓	
3/0.1-0.2 m	✓	✓	✓			✓	
4/0.4-0.5 m	✓	✓	✓	✓	✓	✓	
4/0.7-0.9 m							✓
5/0.3-0.5 m	✓	✓	✓			✓	
6/0.3-0.4	✓	✓	✓	✓	✓	✓	
7/0.1-0.2 m	✓	✓	✓			✓	
8/0.2-0.3 m	✓	✓	✓			✓	
9/0.2-0.4 m	✓	✓	✓			✓	
10/0.4-0.5 m	✓	✓	✓	✓	✓	✓	
11/0.2-0.3 m	✓	✓	✓			✓	
12/0.2-0.4 m	✓	✓	✓	✓	✓	✓	
13/0.4-0.5 m	✓	✓	✓			✓	
14/0.3-0.5 m	✓	✓	✓			✓	
15/0.3-0.4 m	✓	✓	✓			✓	
16/0.2-0.4 m	✓	✓	✓			✓	
17/0.3-0.5 m	✓	✓	✓	✓	✓	✓	
18/0.2-0.3 m	✓	✓	✓			✓	
19/0.2-0.4 m	✓	✓	✓			✓	
20/0.2-0.4 m	✓	✓	✓			✓	
21/0.2-0.4 m	✓	✓	✓			✓	
22/0.3-0.4 m	✓	✓	✓			✓	
23/0.4-0.5 m	✓	✓	✓			✓	
24/0.1-0.3 m	✓	✓	✓	✓	✓	✓	
25/0.1-0.2 m	✓	✓	✓			✓	
26/0.2-0.4 m	✓	✓	✓			✓	
27/0.3-0.5 m	✓	✓	✓			✓	
28/0.25-0.35 m	✓	✓	✓	✓	✓	✓	
FD1/06.04.2020	✓	✓	✓			✓	
FD2/06/04/2020	✓	✓	✓			✓	
Trip blank	✓						



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides In Soil	Acid Extractable metals in soil	On Hold
Trip spike	✓						

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

CERTIFICATE OF ANALYSIS 240507

Client Details

Client	Environmental & Earth Sciences
Attention	Linda Lenihan
Address	PO Box 380, North Sydney, NSW, 2059

Sample Details

Your Reference	<u>120034, Telopea</u>
Number of Samples	33 Soil
Date samples received	07/04/2020
Date completed instructions received	07/04/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	16/04/2020
Date of Issue	16/04/2020
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
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Results Approved By

Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240507-1	240507-2	240507-3	240507-4	240507-6
Your Reference	UNITS	1/0.25-0.35 m	2/0.15-0.25 m	3/0.1-0.2 m	4/0.4-0.5 m	5/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	92	88	95	92	95

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240507-7	240507-8	240507-9	240507-10	240507-11
Your Reference	UNITS	6/0.3-0.4	7/0.1-0.2 m	8/0.2-0.3 m	9/0.2-0.4 m	10/0.4-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	93	86	89	91	90

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240507-12	240507-13	240507-14	240507-15	240507-16
Your Reference	UNITS	11/0.2-0.3 m	12/0.2-0.4 m	13/0.4-0.5 m	14/0.3-0.5 m	15/0.3-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	87	90	90	92	83

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240507-17	240507-18	240507-19	240507-20	240507-21
Your Reference	UNITS	16/0.2-0.4 m	17/0.3-0.5 m	18/0.2-0.3 m	19/0.2-0.4 m	20/0.2-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	90	86	90	90	93

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240507-22	240507-23	240507-24	240507-25	240507-26
Your Reference	UNITS	21/0.2-0.4 m	22/0.3-0.4 m	23/0.4-0.5 m	24/0.1-0.3 m	25/0.1-0.2 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	84	96	92	99	96

vTRH(C6-C10)/BTEXN in Soil

Our Reference		240507-27	240507-28	240507-29	240507-30	240507-31
Your Reference	UNITS	26/0.2-0.4 m	27/0.3-0.5 m	28/0.25-0.35 m	FD1/06.04.2020	FD2/06/04/2020
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020	11/04/2020	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	90	92	96	80	80

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		240507-32	240507-33
Your Reference	UNITS	Trip blank	Trip spike
Date Sampled		06/04/2020	06/04/2020
Type of sample		Soil	Soil
Date extracted	-	08/04/2020	08/04/2020
Date analysed	-	11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	108%
Toluene	mg/kg	<0.5	123%
Ethylbenzene	mg/kg	<1	101%
m+p-xylene	mg/kg	<2	101%
o-Xylene	mg/kg	<1	98%
naphthalene	mg/kg	<1	[NA]
Total +ve Xylenes	mg/kg	<3	[NA]
Surrogate aaa-Trifluorotoluene	%	99	96

svTRH (C10-C40) in Soil						
Our Reference		240507-1	240507-2	240507-3	240507-4	240507-6
Your Reference	UNITS	1/0.25-0.35 m	2/0.15-0.25 m	3/0.1-0.2 m	4/0.4-0.5 m	5/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	150	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	190	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	190	<50	<50	<50
Surrogate o-Terphenyl	%	107	113	113	115	111

svTRH (C10-C40) in Soil						
Our Reference		240507-7	240507-8	240507-9	240507-10	240507-11
Your Reference	UNITS	6/0.3-0.4	7/0.1-0.2 m	8/0.2-0.3 m	9/0.2-0.4 m	10/0.4-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	116	107	114	114	115

svTRH (C10-C40) in Soil

Our Reference		240507-12	240507-13	240507-14	240507-15	240507-16
Your Reference	UNITS	11/0.2-0.3 m	12/0.2-0.4 m	13/0.4-0.5 m	14/0.3-0.5 m	15/0.3-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	09/04/2020	09/04/2020	09/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	110	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	140	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	140	<50	<50
Surrogate o-Terphenyl	%	113	114	113	115	111

svTRH (C10-C40) in Soil

Our Reference		240507-17	240507-18	240507-19	240507-20	240507-21
Your Reference	UNITS	16/0.2-0.4 m	17/0.3-0.5 m	18/0.2-0.3 m	19/0.2-0.4 m	20/0.2-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	08/04/2020	08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	112	110	104	112	113

svTRH (C10-C40) in Soil

Our Reference		240507-22	240507-23	240507-24	240507-25	240507-26
Your Reference	UNITS	21/0.2-0.4 m	22/0.3-0.4 m	23/0.4-0.5 m	24/0.1-0.3 m	25/0.1-0.2 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	110	111	111	104	105

svTRH (C10-C40) in Soil

Our Reference		240507-27	240507-28	240507-29	240507-30	240507-31
Your Reference	UNITS	26/0.2-0.4 m	27/0.3-0.5 m	28/0.25-0.35 m	FD1/06.04.2020	FD2/06/04/2020
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	108	108	105	107	105

PAHs in Soil						
Our Reference		240507-1	240507-2	240507-3	240507-4	240507-6
Your Reference	UNITS	1/0.25-0.35 m	2/0.15-0.25 m	3/0.1-0.2 m	4/0.4-0.5 m	5/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<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
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	124	109	107	92	94

PAHs in Soil						
Our Reference		240507-7	240507-8	240507-9	240507-10	240507-11
Your Reference	UNITS	6/0.3-0.4	7/0.1-0.2 m	8/0.2-0.3 m	9/0.2-0.4 m	10/0.4-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<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
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	97	90	89	99	91

PAHs in Soil						
Our Reference		240507-12	240507-13	240507-14	240507-15	240507-16
Your Reference	UNITS	11/0.2-0.3 m	12/0.2-0.4 m	13/0.4-0.5 m	14/0.3-0.5 m	15/0.3-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<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
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	92	94	95	93	99

PAHs in Soil						
Our Reference		240507-17	240507-18	240507-19	240507-20	240507-21
Your Reference	UNITS	16/0.2-0.4 m	17/0.3-0.5 m	18/0.2-0.3 m	19/0.2-0.4 m	20/0.2-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<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
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	96	105	102	106

PAHs in Soil						
Our Reference		240507-22	240507-23	240507-24	240507-25	240507-26
Your Reference	UNITS	21/0.2-0.4 m	22/0.3-0.4 m	23/0.4-0.5 m	24/0.1-0.3 m	25/0.1-0.2 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<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
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	103	102	102	99	98

PAHs in Soil						
Our Reference		240507-27	240507-28	240507-29	240507-30	240507-31
Your Reference	UNITS	26/0.2-0.4 m	27/0.3-0.5 m	28/0.25-0.35 m	FD1/06.04.2020	FD2/06/04/2020
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.1	<0.1	<0.1
Pyrene	mg/kg	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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.07	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<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
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.3	<0.05	0.2	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	107	102	104	102	98

Organochlorine Pesticides in soil						
Our Reference		240507-4	240507-7	240507-11	240507-13	240507-18
Your Reference	UNITS	4/0.4-0.5 m	6/0.3-0.4	10/0.4-0.5 m	12/0.2-0.4 m	17/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	71	75	76	79	74

Organochlorine Pesticides in soil			
Our Reference		240507-25	240507-29
Your Reference	UNITS	24/0.1-0.3 m	28/0.25-0.35 m
Date Sampled		06/04/2020	06/04/2020
Type of sample		Soil	Soil
Date extracted	-	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	0.2	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	0.2	<0.1
Surrogate TCMX	%	83	86

Organophosphorus Pesticides in Soil

Our Reference		240507-4	240507-7	240507-11	240507-13	240507-18
Your Reference	UNITS	4/0.4-0.5 m	6/0.3-0.4	10/0.4-0.5 m	12/0.2-0.4 m	17/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	71	75	76	79	74

Organophosphorus Pesticides in Soil

Our Reference		240507-25	240507-29
Your Reference	UNITS	24/0.1-0.3 m	28/0.25-0.35 m
Date Sampled		06/04/2020	06/04/2020
Type of sample		Soil	Soil
Date extracted	-	08/04/2020	08/04/2020
Date analysed	-	08/04/2020	08/04/2020
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	83	86

Acid Extractable metals in soil

Our Reference		240507-1	240507-2	240507-3	240507-4	240507-6
Your Reference	UNITS	1/0.25-0.35 m	2/0.15-0.25 m	3/0.1-0.2 m	4/0.4-0.5 m	5/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Arsenic	mg/kg	7	9	9	15	14
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	15	17	20	22
Copper	mg/kg	16	20	20	24	37
Lead	mg/kg	31	31	55	81	81
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Nickel	mg/kg	5	5	6	7	13
Zinc	mg/kg	28	42	100	100	99

Acid Extractable metals in soil

Our Reference		240507-7	240507-8	240507-9	240507-10	240507-11
Your Reference	UNITS	6/0.3-0.4	7/0.1-0.2 m	8/0.2-0.3 m	9/0.2-0.4 m	10/0.4-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Arsenic	mg/kg	9	6	8	6	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	13	17	16	10
Copper	mg/kg	18	24	18	13	16
Lead	mg/kg	25	37	59	18	27
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	6	5	5	4
Zinc	mg/kg	16	39	57	20	33

Acid Extractable metals in soil

Our Reference		240507-12	240507-13	240507-14	240507-15	240507-16
Your Reference	UNITS	11/0.2-0.3 m	12/0.2-0.4 m	13/0.4-0.5 m	14/0.3-0.5 m	15/0.3-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Arsenic	mg/kg	7	7	5	6	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	19	17	17	17
Copper	mg/kg	15	10	13	15	12
Lead	mg/kg	32	19	18	26	24
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	2	3	2	5
Zinc	mg/kg	92	6	9	17	16

Acid Extractable metals in soil

Our Reference		240507-17	240507-18	240507-19	240507-20	240507-21
Your Reference	UNITS	16/0.2-0.4 m	17/0.3-0.5 m	18/0.2-0.3 m	19/0.2-0.4 m	20/0.2-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Arsenic	mg/kg	8	6	7	7	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	12	22	19	25
Copper	mg/kg	15	11	9	11	10
Lead	mg/kg	14	15	15	20	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	5	2	1	3
Zinc	mg/kg	22	17	9	5	6

Acid Extractable metals in soil

Our Reference		240507-22	240507-23	240507-24	240507-25	240507-26
Your Reference	UNITS	21/0.2-0.4 m	22/0.3-0.4 m	23/0.4-0.5 m	24/0.1-0.3 m	25/0.1-0.2 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Arsenic	mg/kg	6	7	6	8	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	19	31	10	24
Copper	mg/kg	12	17	8	36	4
Lead	mg/kg	19	87	21	17	15
Mercury	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Nickel	mg/kg	6	6	5	38	2
Zinc	mg/kg	19	91	13	36	4

Acid Extractable metals in soil

Our Reference		240507-27	240507-28	240507-29	240507-30	240507-31
Your Reference	UNITS	26/0.2-0.4 m	27/0.3-0.5 m	28/0.25-0.35 m	FD1/06.04.2020	FD2/06/04/2020
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Arsenic	mg/kg	9	6	<4	8	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	17	19	15	20
Copper	mg/kg	23	15	10	19	7
Lead	mg/kg	50	20	23	32	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	5	13	5	3
Zinc	mg/kg	79	14	14	31	11

Acid Extractable metals in soil			
Our Reference		240507-34	240507-35
Your Reference	UNITS	10/0.4-0.5 m - [TRIPLICATE]	FD2/06/04/2020 - [TRIPLICATE]
Date Sampled		06/04/2020	06/04/2020
Type of sample		Soil	Soil
Date prepared	-	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020
Arsenic	mg/kg	7	5
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	11	17
Copper	mg/kg	19	11
Lead	mg/kg	23	22
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	4	3
Zinc	mg/kg	36	20

Moisture						
Our Reference	UNITS	240507-1	240507-2	240507-3	240507-4	240507-6
Your Reference		1/0.25-0.35 m	2/0.15-0.25 m	3/0.1-0.2 m	4/0.4-0.5 m	5/0.3-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Moisture	%	18	24	18	20	10

Moisture						
Our Reference	UNITS	240507-7	240507-8	240507-9	240507-10	240507-11
Your Reference		6/0.3-0.4	7/0.1-0.2 m	8/0.2-0.3 m	9/0.2-0.4 m	10/0.4-0.5 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Moisture	%	19	18	22	19	20

Moisture						
Our Reference	UNITS	240507-12	240507-13	240507-14	240507-15	240507-16
Your Reference		11/0.2-0.3 m	12/0.2-0.4 m	13/0.4-0.5 m	14/0.3-0.5 m	15/0.3-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Moisture	%	17	22	20	21	21

Moisture						
Our Reference	UNITS	240507-17	240507-18	240507-19	240507-20	240507-21
Your Reference		16/0.2-0.4 m	17/0.3-0.5 m	18/0.2-0.3 m	19/0.2-0.4 m	20/0.2-0.4 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Moisture	%	19	15	23	21	24

Moisture						
Our Reference	UNITS	240507-22	240507-23	240507-24	240507-25	240507-26
Your Reference		21/0.2-0.4 m	22/0.3-0.4 m	23/0.4-0.5 m	24/0.1-0.3 m	25/0.1-0.2 m
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Moisture	%	20	19	21	8.5	19

Moisture						
Our Reference		240507-27	240507-28	240507-29	240507-30	240507-31
Your Reference	UNITS	26/0.2-0.4 m	27/0.3-0.5 m	28/0.25-0.35 m	FD1/06.04.2020	FD2/06/04/2020
Date Sampled		06/04/2020	06/04/2020	06/04/2020	06/04/2020	06/04/2020
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/04/2020	08/04/2020	08/04/2020	08/04/2020	08/04/2020
Date analysed	-	09/04/2020	09/04/2020	09/04/2020	09/04/2020	09/04/2020
Moisture	%	23	22	12	18	19

Method ID	Methodology Summary
AT-008	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012/017	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS.
Org-012/017	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS and/or GC-MS/MS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-012/017	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. <p>Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.</p>
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	<p>Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.</p> <p>Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.</p>

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	240507-7
Date extracted	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			11/04/2020	4	11/04/2020	11/04/2020		11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	4	<25	<25	0	86	78
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	4	<25	<25	0	86	78
Benzene	mg/kg	0.2	Org-016	<0.2	4	<0.2	<0.2	0	77	68
Toluene	mg/kg	0.5	Org-016	<0.5	4	<0.5	<0.5	0	88	78
Ethylbenzene	mg/kg	1	Org-016	<1	4	<1	<1	0	91	83
m+p-xylene	mg/kg	2	Org-016	<2	4	<2	<2	0	88	80
o-Xylene	mg/kg	1	Org-016	<1	4	<1	<1	0	85	76
naphthalene	mg/kg	1	Org-014	<1	4	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	4	92	93	1	98	84

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	240507-22
Date extracted	-			[NT]	11	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			[NT]	11	11/04/2020	11/04/2020		11/04/2020	11/04/2020
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	11	<25	<25	0	88	85
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	11	<25	<25	0	88	85
Benzene	mg/kg	0.2	Org-016	[NT]	11	<0.2	<0.2	0	78	75
Toluene	mg/kg	0.5	Org-016	[NT]	11	<0.5	<0.5	0	90	86
Ethylbenzene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	92	90
m+p-xylene	mg/kg	2	Org-016	[NT]	11	<2	<2	0	89	87
o-Xylene	mg/kg	1	Org-016	[NT]	11	<1	<1	0	86	83
naphthalene	mg/kg	1	Org-014	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	11	90	85	6	101	88

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	21	11/04/2020	11/04/2020		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	21	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	21	93	88	6	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	31	11/04/2020	11/04/2020		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	31	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	31	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	31	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	31	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	31	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	31	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	31	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	31	80	95	17	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	240507-7
Date extracted	-			08/04/2020	11	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			08/04/2020	11	08/04/2020	08/04/2020		08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	11	<50	<50	0	126	83
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	11	<100	<100	0	105	72
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	11	<100	<100	0	95	117
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	11	<50	<50	0	126	83
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	11	<100	<100	0	105	72
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	11	<100	<100	0	95	117
Surrogate o-Terphenyl	%		Org-003	113	11	115	114	1	132	116

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	240507-22
Date extracted	-			[NT]	21	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			[NT]	21	08/04/2020	08/04/2020		08/04/2020	08/04/2020
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	21	<50	<50	0	121	120
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	21	<100	<100	0	104	99
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	21	<100	<100	0	97	88
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	21	<50	<50	0	121	120
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	21	<100	<100	0	104	99
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	21	<100	<100	0	97	88
Surrogate o-Terphenyl	%		Org-003	[NT]	21	113	113	0	128	110

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	31	08/04/2020	08/04/2020		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	31	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	31	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	31	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	31	105	106	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	240507-7
Date extracted	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	14/04/2020
Date analysed	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	14/04/2020
Naphthalene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	80	86
Acenaphthylene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	86	92
Phenanthrene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	90	90
Anthracene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	82	88
Pyrene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	78	82
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	104	80
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	<0.2	4	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	<0.05	4	<0.05	<0.05	0	70	90
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	88	4	92	92	0	110	91

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	240507-22
Date extracted	-			[NT]	11	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			[NT]	11	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	68	78
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	74	86
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	76	88
Anthracene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	70	80
Pyrene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	66	76
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	84	94
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	11	<0.05	<0.05	0	64	66
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	11	91	101	10	91	100

QUALITY CONTROL: PAHs in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	21	08/04/2020	08/04/2020		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	21	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	21	106	104	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	31	08/04/2020	08/04/2020		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012/017	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012/017	[NT]	31	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012/017	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012/017	[NT]	31	98	96	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	240507-7
Date extracted	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	14/04/2020
Date analysed	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	14/04/2020
alpha-BHC	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	98	104
HCB	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	98	90
gamma-BHC	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	92	80
delta-BHC	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	108	100
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	106	96
gamma-Chlordane	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	104	82
Dieldrin	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	106	90
Endrin	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	86	90
Endosulfan II	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	92	94
Endrin Aldehyde	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	72	96
Methoxychlor	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	78	4	71	70	1	92	92

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	08/04/2020	08/04/2020		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	11	76	88	15	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	240507-7
Date extracted	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	14/04/2020
Date analysed	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	14/04/2020
Dichlorvos	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	68	86
Dimethoate	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	90	100
Fenitrothion	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	60	98
Malathion	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	64	114
Chlorpyrifos	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	98	106
Parathion	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	60	90
Bromophos-ethyl	mg/kg	0.1	AT-008	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	70	102
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	78	4	71	70	1	92	92

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	11	08/04/2020	08/04/2020		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	AT-008	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-012/017	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-012/017	[NT]	11	76	88	15	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	240507-7
Date prepared	-			08/04/2020	4	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			09/04/2020	4	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Arsenic	mg/kg	4	Metals-020	<4	4	15	17	12	104	81
Cadmium	mg/kg	0.4	Metals-020	<0.4	4	<0.4	<0.4	0	98	79
Chromium	mg/kg	1	Metals-020	<1	4	20	19	5	110	86
Copper	mg/kg	1	Metals-020	<1	4	24	23	4	111	102
Lead	mg/kg	1	Metals-020	<1	4	81	79	2	114	81
Mercury	mg/kg	0.1	Metals-021	<0.1	4	0.1	<0.1	0	96	80
Nickel	mg/kg	1	Metals-020	<1	4	7	6	15	104	86
Zinc	mg/kg	1	Metals-020	<1	4	100	100	0	107	80

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	240507-22
Date prepared	-			[NT]	11	08/04/2020	08/04/2020		08/04/2020	08/04/2020
Date analysed	-			[NT]	11	09/04/2020	09/04/2020		09/04/2020	09/04/2020
Arsenic	mg/kg	4	Metals-020	[NT]	11	5	9	57	100	75
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	94	78
Chromium	mg/kg	1	Metals-020	[NT]	11	10	15	40	105	93
Copper	mg/kg	1	Metals-020	[NT]	11	16	18	12	107	100
Lead	mg/kg	1	Metals-020	[NT]	11	27	36	29	109	88
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	92	84
Nickel	mg/kg	1	Metals-020	[NT]	11	4	4	0	99	82
Zinc	mg/kg	1	Metals-020	[NT]	11	33	40	19	97	76

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	21	09/04/2020	09/04/2020		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	7	7	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	25	26	4	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	10	10	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	17	16	6	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	3	2	40	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	6	4	40	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	31	08/04/2020	08/04/2020		[NT]	[NT]
Date analysed	-			[NT]	31	09/04/2020	09/04/2020		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	31	6	6	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	31	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	31	20	18	11	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	31	7	11	44	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	31	18	19	5	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	31	3	5	50	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	31	11	13	17	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil:

- The laboratory RPD acceptance criteria has been exceeded for 240507-11 for Cr. Therefore a triplicate result has been issued as laboratory sample number 240507-34.
- The laboratory RPD acceptance criteria has been exceeded for 240507-31 for Cu. Therefore a triplicate result has been issued as laboratory sample number 240507-35.

CHAIN OF CUSTODY - ANALYSIS REQUEST FORM

Job No: **120034**

Laboratory: Envirolab

Project Manager: Linda Lenihan

Sampler: LL and NE

Site Location: Teloepa

Sheet: 1 of 2

No. of samples	Sample ID/ Depth	Anticipated Result (PID)/EC reading	Date sampled	Time sampled	Sample Matrix			Analysis Required										HOLD	Sample-specific instructions/ notes	
					Soil	Water	Sediment	Combo 3	OC/OP	TRH / BTEX	BTEX									
1	1/0.25-0.35 m		6.4.2020		X			X												Quotation 20SY126
2	2/0.15-0.25 m		6.4.2020		X			X												
3	3/0.1-0.2 m		6.4.2020		X			X												
4	4/0.4-0.5 m		6.4.2020		X			X	X											
5	4/0.7-0.9 m		6.4.2020		X													X		
6	5/0.3-0.5 m		6.4.2020		X			X												
7	6/0.3-0.4		6.4.2020		X			X	X											
8	7/0.1-0.2 m		6.4.2020		X			X												
9	8/0.2-0.3 m		6.4.2020		X			X												
10	9/0.2-0.4 m		6.4.2020		X			X												
11	10/0.4-0.5 m		6.4.2020		X			X	X											
12	11/0.2-0.3 m		6.4.2020		X			X												
13	12/0.2-0.4 m		6.4.2020		X			X	X											
14	13/0.4-0.5 m		6.4.2020		X			X												
15	14/0.3-0.5 m		6.4.2020		X			X												
16	15/0.3-0.4 m		6.4.2020		X			X												
17	16/0.2-0.4 m		6.4.2020		X			X												
18	17/0.3-0.5 m		6.4.2020		X			X	x											
19	18/0.2-0.3 m		6.4.2020		X			X												
20	19/0.2-0.4 m		6.4.2020		X			X												
	TOTAL																			

Emergency Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9940 6200

Job No: **240507**

Date Received: **7/4/20**

Time Received: **1400**

Received by: **CMS**

Temp: **Cool/Ambient**

Cooling: **Icepack**

Security: **Intact/Broken/None**

Turn Around (circle):

NORMAL

Comments/ Instructions:

• Quotation – 20SY126

Lab Quotation No. (if applicable): Quotation 20SY126

Send report to (email address): llenihan@eesigroup.com

Cc: report to (email address): neldridge@eesigroup.com

Cc: invoice to (email address): accounts@eesigroup.com

Sent off Site/Office by:

Natalie Eldridge

07.04.2020

Receiving Lab:

Receiving Lab:

Phone: (02) 9922 1777
Fax: (02) 9922 1010

PO Box: 380, North Sydney NSW 2059

Email: eesNSW@eesigroup.com



**ENVIRONMENTAL EARTH
SCIENCES**
CONTAMINATION RESOLVED

CHAIN OF CUSTODY - ANALYSIS REQUEST FORM

Job No: **120034**

Laboratory: **Envirolab**

Project Manager: Linda Lenihan

Sampler: LL and NE

Site Location: Teloepa

Sheet: 1 of 2

240507

[illegible]

Turn Around (circle):

NORMAL

Comments/ Instructions:

Quotation – 20SY126

Lab Quotation No. (if applicable) : Quotation 20SY126

Send report to (email address) : llenihan@eesigroup.com

Cc: report to (email address): neldridge@eesigroup.com

Cc: invoice to (email address): accounts@eesigroup.com

Name

Signature

Date _____

Time

Sent off Site/Office by:

Natalie Eldridge

07.04.2020

Receiving Lab:

Receiving Lab:

CHANGE IN

7	4	2
---	---	---

1402

Phone: (02) 9922 1777

Fax: (02) 9922 1010

PO Box: 380, North Sydney NSW 2059

Email: eesNSW@eesigroup.com



**ENVIRONMENTAL EARTH
SCIENCES**
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AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET81428 / 84608 / 1 - 18

Your ref : 120034 - Telopea

NATA Accreditation No: 14484

8 April 2020

Environmental & Earth Sciences

PO Box 380

North Sydney NSW 2059

Attn: Ms Natalie Eldridge



Dear Natalie

Accredited for compliance with ISO/IEC 17025 - Testing.

Asbestos Identification

This report presents the results of eighteen samples, forwarded by Environmental & Earth Sciences on 7 April 2020, for analysis for asbestos.

1.Introduction:Eighteen samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method (**Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction**) (**Qualitative Analysis only**).

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF**(Asbestos Fines), **FA**(Friable Asbestos and **ACM** (Asbestos Containing Material), also satisfying the requirements of the WA/ NEPM Guidelines)

3. Results : **Ω Sample No. 1. ASET81428 / 84608 / 1. 120034 - 1/0.25-0.35 m.**

Approx dimensions 10.0 cm x 10.0 cm x 3.2 cm

Approximate total dry weight of soil = 323g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips and plant matter.

No asbestos detected.

Ω Sample No. 2. ASET81428 / 84608 / 2. 120034 - 3/0.1-0.2 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.8 cm

Approximate total dry weight of soil = 381g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips and plant matter.

No asbestos detected.

Ω Sample No. 3. ASET81428 / 84608 / 3. 120034 - 5/0.3-0.5 m.

Approx dimensions 10.0 cm x 10.0 cm x 4.1 cm

Approximate total dry weight of soil = 413g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips and plant matter.

No asbestos detected.

SUITE 710 / 90 GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635

PHONE: (02) 99872183 FAX: (02)99872151 EMAIL: info@ausset.com.au WEBSITE: www.Ausset.com.au

OCCUPATIONAL HEALTH & SAFETY STUDIES • INDOOR AIR QUALITY SURVEYS • HAZARDOUS MATERIAL SURVEYS • RADIATION SURVEYS • ASBESTOS SURVEYS
ASBESTOS DETECTION & IDENTIFICATION • REPAIR & CALIBRATION OF SCIENTIFIC EQUIPMENT • AIRBORNE FIBRE & SILICA MONITORING



Q 4. ASET81428 / 84608 / 4. 120034 - 6/0.3-0.4 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.4 cm

Approximate total dry weight of soil = 342g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips and plant matter.

No asbestos detected.

Q Sample No. 5. ASET81428 / 84608 / 5. 120034 - 9/0.2-0.4 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.9 cm

Approximate total dry weight of soil = 388g.

The sample consisted of a mixture of clayish sandy soil, stones, charcoal and plant matter.

No asbestos detected.

Q Sample No. 6. ASET81428 / 84608 / 6. 120034 - 11/0.2-0.3 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.6 cm

Approximate total dry weight of soil = 358g.

The sample consisted of a mixture of clayish sandy soil, stones, shale, plant matter and fragments of glass.

No asbestos detected.

Q Sample No. 7. ASET81428 / 84608 / 7. 120034 - 12/0.2-0.4 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.7 cm

The sample consisted of a mixture of clayish sandy soil, stones, wood chips, plant matter and fragments of fibre cement* (ACM).

Chrysotile* (Approximate estimated weight = 0.54g) asbestos, Amosite* (Approximate estimated weight = 0.11g) asbestos and Crocidolite* (Approximate estimated weight = 0.23g) asbestos detected

Approximate total dry weight of soil = 374g.

Approximate estimated weight of asbestos in soil in the form of ACM = 0.88g

Approximate w/w percentage of asbestos in soil in the form of ACM = 0.23%.

Q Sample No. 8. ASET81428 / 84608 / 8. 120034 - 15/0.3-0.4 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.5 cm

Approximate total dry weight of soil = 355g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips, charcoal and plant matter.

No asbestos detected.

Q Sample No. 9. ASET81428 / 84608 / 9. 120034 - 17/0.3-0.5 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.9 cm

Approximate total dry weight of soil = 391g.

The sample consisted of a mixture of clayish sandy soil, stones, charcoal, shale and plant matter.

No asbestos detected.

Q Sample No. 10. ASET81428 / 84608 / 10. 120034 - 18/0.2-0.3 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.4 cm

Approximate total dry weight of soil = 342g.

The sample consisted of a mixture of clayish sandy soil, stones, charcoal, plant matter and fragments of plastic and metal.

No asbestos detected.



Ω Sample No. 11. ASET81428 / 84608 / 11. 120034 - 19/0.2-0.4 m.

Approx dimensions 10.0 cm x 10.0 cm x 4.2 cm

Approximate total dry weight of soil = 417g.

The sample consisted of a mixture of clayish sandy soil, stones, charcoal and plant matter.

No asbestos detected.

Sample No. 12. ASET81428 / 84608 / 12. 120034 - 24/0.1-0.3 m.

Approx dimensions 10.0 cm x 10.0 cm x 5.3 cm

Approximate total dry weight of soil = 531g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips, plant matter and fragments of cement and brick.

No asbestos detected.

Ω Sample No. 13. ASET81428 / 84608 / 13. 120034 - 10/0.4 m.

Approx dimensions 10.0 cm x 10.0 cm x 3.9 cm

Approximate total dry weight of soil = 392g.

The sample consisted of a mixture of clayish sandy soil, stones, wood chips, plant matter and fragments of cement, brick and ceramic tile.

No asbestos detected.

Ω Sample No. 14. ASET81428 / 84608 / 14. 120034 - 27/0.3-0.5 m.

Approx dimensions 10.0 cm x 10.0 cm x 4.1 cm

Approximate total dry weight of soil = 409g.

The sample consisted of a mixture of clayish sandy soil, stones, charcoal and plant matter.

No asbestos detected.

λ Sample No. 15. ASET81428 / 84608 / 15. 120034 - PACM-1.

Approx dimensions 12.0 cm x 4.5 cm x 0.4 cm

The sample consisted of a fragment of a fibre cement material.

Chrysotile asbestos, Amosite asbestos and Crocidolite asbestos detected.

λ Sample No. 16. ASET81428 / 84608 / 16. 120034 - PACM-2.

Approx dimensions 5.4 cm x 4.0 cm x 0.5 cm

The sample consisted of a fragment of a fibro plaster cement material containing organic fibres.

Chrysotile asbestos detected.

λ Sample No. 17. ASET81428 / 84608 / 17. 120034 - PACM-3.

Approx dimensions 4.7 cm x 3.0 cm x 0.4 cm

The sample consisted of a fragment of a fibro plaster cement material containing organic fibres.

Chrysotile asbestos detected.



λ 18. ASET81428 / 84608 / 18. 120034 - PACM-4.

Approx dimensions 12.0 cm x 3.5 cm x 0.4 cm

The sample consisted of a fragment of a fibre cement material.

Chrysotile asbestos, Amosite asbestos and Crocidolite asbestos detected.

Reported by,

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory



Accredited for compliance with ISO/IEC 17025 - Testing.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites in Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service.

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages if given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust.

*** denotes asbestos detected in ACM in bonded form.**

denotes friable asbestos as soft fibro plaster and/ or highly weathered ACM that will easily crumble.

λ denotes samples that have been analysed only in accordance to AS 4964 – 2004.

Ω Sample volume criteria of 500mL have not been satisfied.



The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by AS4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

Estimation of asbestos weights involves the use of following assumptions;

Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.

All samples indicating "No asbestos detected" are assumed to be less than 0.001 % unless the actual approximate weight is given.

CHAIN OF CUSTODY - ANALYSIS REQUEST FORM

Job No: 120034

Laboratory: ASET

Project Manager: Linda Lenihan

Sampler: LL and NE

Site Location: Telopea

Sheet: 1 of 1

No. of samples	Sample ID/ Depth	Anticipated Result (PID)/EC reading	Date sampled	Time sampled	Sample Matrix			Analysis Required										HOLD	Sample-specific instructions/ notes		
					Soil	Water	Material	Asbestos (WA/NEPM)	Asbestos in material (AS samples)												
1	1/0.25-0.35 m		6.4.2020		X			X													
2	3/0.1-0.2 m		6.4.2020		X			X													
3	5/0.3-0.5 m		6.4.2020		X			X													
4	6/0.3-0.4		6.4.2020		X			X													
5	9/0.2-0.4 m		6.4.2020		X			X													
6	11/0.2-0.3 m		6.4.2020		X			X													
7	12/0.2-0.4 m		6.4.2020		X			X													
	13/0.4-0.5 m		6.4.2020		X														X		Please analyse samples in accordance with Asbestos (WA/NEPM)
8	15/0.3-0.4 m		6.4.2020		X			X													
9	17/0.3-0.5 m		6.4.2020		X			X													
10	18/0.2-0.3 m		6.4.2020		X			X													
11	19/0.2-0.4 m		6.4.2020		X			X													
	23/0.4-0.5 m		6.4.2020		X														X		
12	24/0.1-0.3 m		6.4.2020		X			X													
13	25/0.1-0.2 m 10/0.4 m		6.4.2020		X			X													
14	27/0.3-0.5 m		6.4.2020		X			X													
15	PACM-1		6.4.2020				X		X												
16	PACM-2		6.4.2020				X		X												
17	PACM-3		6.4.2020				X		X												
18	PACM-4		6.4.2020				X		X												
	TOTAL																				

Turn Around (circle):

NORMAL 24 hr

Comments/ Instructions:

Lab Quotation No. (if applicable): Quotation 20SY126

Send report to (email address): llenihan@eesigroup.com

Cc: report to (email address): neldridge@eesigroup.com

Cc: invoice to (email address): accounts@eesigroup.com

Sent off Site/Office by:

Name

Natalie Eldridge

Signature

Date

07.04.2020

Time

Receiving Lab:

Receiving Lab:

Phone: (02) 9922 1777

Fax: (02) 9922 1010

PO Box: 380, North Sydney NSW 2059

Email: eesNSW@eesigroup.com


**ENVIRONMENTAL EARTH
SCIENCES**
CONTAMINATION RESOLVED

APPENDIX G: 95% PRO UCL

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	Date/Time of Computation		ProUCL 5.127/04/2020 3:20:36 PM									
5	From File		PRO UCL.xls									
6	Full Precision		OFF									
7	Confidence Coefficient		95%									
8	Number of Bootstrap Operations		2000									
9												
10												
11	Zn											
12												
13	General Statistics											
14	Total Number of Observations		33		Number of Distinct Observations		22					
15					Number of Missing Observations		0					
16			Minimum	4			Mean	32.3				
17			Maximum	100			Median	17				
18			SD	31.72			Std. Error of Mean	5.521				
19			Coefficient of Variation	0.982			Skewness	1.31				
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic		0.755		Shapiro Wilk GOF Test							
23	5% Shapiro Wilk Critical Value		0.931		Data Not Normal at 5% Significance Level							
24	Lilliefors Test Statistic		0.264		Lilliefors GOF Test							
25	5% Lilliefors Critical Value		0.152		Data Not Normal at 5% Significance Level							
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
30	95% Student's-t UCL		41.66		95% Adjusted-CLT UCL (Chen-1995)		42.73					
31					95% Modified-t UCL (Johnson-1978)		41.87					
32												
33	Gamma GOF Test											
34	A-D Test Statistic		1.163		Anderson-Darling Gamma GOF Test							
35	5% A-D Critical Value		0.77		Data Not Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic		0.182		Kolmogorov-Smirnov Gamma GOF Test							
37	5% K-S Critical Value		0.157		Data Not Gamma Distributed at 5% Significance Level							
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)		1.271		k star (bias corrected MLE)		1.175					
42	Theta hat (MLE)		25.42		Theta star (bias corrected MLE)		27.49					
43	nu hat (MLE)		83.85		nu star (bias corrected)		77.57					
44	MLE Mean (bias corrected)		32.3		MLE Sd (bias corrected)		29.8					
45					Approximate Chi Square Value (0.05)		58.28					
46	Adjusted Level of Significance		0.0419		Adjusted Chi Square Value		57.42					
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))		42.99		95% Adjusted Gamma UCL (use when n<50)		43.64					
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic		0.934		Shapiro Wilk Lognormal GOF Test							
53	5% Shapiro Wilk Critical Value		0.931		Data appear Lognormal at 5% Significance Level							
54	Lilliefors Test Statistic		0.121		Lilliefors Lognormal GOF Test							
55	5% Lilliefors Critical Value		0.152		Data appear Lognormal at 5% Significance Level							

	A	B	C	D	E	F	G	H	I	J	K	L
56	Data appear Lognormal at 5% Significance Level											
57												
58	Lognormal Statistics											
59	Minimum of Logged Data				1.386		Mean of logged Data				3.033	
60	Maximum of Logged Data				4.605		SD of logged Data				0.964	
61												
62	Assuming Lognormal Distribution											
63	95% H-UCL				49.7		90% Chebyshev (MVUE) UCL				51.06	
64	95% Chebyshev (MVUE) UCL				59.53		97.5% Chebyshev (MVUE) UCL				71.27	
65	99% Chebyshev (MVUE) UCL				94.35							
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data appear to follow a Discernible Distribution at 5% Significance Level											
69												
70	Nonparametric Distribution Free UCLs											
71	95% CLT UCL				41.38		95% Jackknife UCL				41.66	
72	95% Standard Bootstrap UCL				41.37		95% Bootstrap-t UCL				43.26	
73	95% Hall's Bootstrap UCL				42.33		95% Percentile Bootstrap UCL				41.27	
74	95% BCA Bootstrap UCL				43.45							
75	90% Chebyshev(Mean, Sd) UCL				48.87		95% Chebyshev(Mean, Sd) UCL				56.37	
76	97.5% Chebyshev(Mean, Sd) UCL				66.78		99% Chebyshev(Mean, Sd) UCL				87.24	
77												
78	Suggested UCL to Use											
79	95% H-UCL				49.7							
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												
86	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
87	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
88	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
89	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
90												