

Preliminary Site Investigation

Huntlee Future Council Lot

304001022-015



Prepared for
Huntlee Pty Ltd

3 July 2025

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1 Introduction

This report presents the findings of a Preliminary Site Investigation (PSI) undertaken by Stantec Australia Pty Ltd (Stantec) for a future allotment intended to be dedicated to Cessnock City Council ('council'), located in North Rothbury, NSW. The works have been undertaken at the request of Mr Glenn Swan of Huntlee Pty Ltd (the 'client').

The future Huntlee council lot (the 'site') is located at 1769 Wine Country Drive, North Rothbury, and forms part of Lot 696 DP1263808. The site locality, including the assessment area extents, is shown in Drawing D1 attached within Appendix A.

The client is currently proposing a modification ('Mod 25') to the existing Huntlee New Town Stage 1 development application (DA), with the modification including an extension of the current DA boundary to incorporate the future council lot site. It is understood that a PSI is required to support the proposed DA modification to provide preliminary advice on the contamination status of the site and subsequent implications for the intended future use.

Review of the Huntlee New Town Stage 2 DA concept masterplan prepared by Daly.Smith (ref. 20406, sheet. 1, ver. 17, date. 14/05/2025) indicates the site area is allocated as a 'Town Centre' area. It is also understood that the future development is to comprise a community hub, however limited details are presently available. This preliminary assessment has been undertaken with reference to a future residential land use application and associated assessment criteria, which is generally considered the conservative approach.

The objectives of this PSI were to:

- > Identify onsite or offsite potential sources of contamination, including contaminants of potential concern.
- > Identify onsite areas of potential contamination and potentially affected media.
- > Identify potential human and ecological receptors associated with the proposed development.
- > Provide preliminary assessment on the contamination status of the site, and whether contamination is likely to impact the proposed development.
- > Provide commentary on the need for further environmental investigation / assessment.

This assessment has generally been undertaken with reference to the following guidelines:

- > National Environment Protection Council (NEPC): National Environment Protection (Assessment of Site Contamination) Measure, 1999 (*amended 2013*) 'NEPM (2013)' [1].
- > NSW Environment Protection Authority (EPA): Consultants Reporting on Contaminated Land, 2020 [2].
- > Department of Urban Affairs and Planning: Managing Contaminated Land, Planning Guidelines SEPP 55 - Remediation of Land, 1998 [3].

Stantec have also undertaken preliminary geotechnical assessment for the future council lot site concurrent to this investigation, which has been documented under a separate report cover (ref. 304001022-114.1, ver. 1, dated. 03/07/2025).

2 Scope of Works

To meet the objectives of this investigation, the following general scope of works was undertaken:

- > Review of publicly available and supplied site history information, including:
 - Historical documents and previous site assessment reports.
 - NSW EPA databases.
 - Historical aerial photographs.
- > Review of published / available information on environmental site setting, including:
 - Site topographical contours and drainage lines.
 - Soil landscape, geological, and hydrogeological mappings.
 - Acid sulfate soils risk maps.
 - Registered and/or available groundwater bore information.
- > Site walkover and visual inspection of the site and immediate surrounds, including mapping of site conditions and recording of salient site features.
- > Recovery of numerous environmental soil samples at targeted locations via a combination of test pit excavations, hand augered boreholes, and hand tools/equipment.
- > Various laboratory chemical analysis on selected soil samples, including testing for:
 - Total Recoverable Hydrocarbons (TRH)
 - Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene (BTEXN)
 - Polycyclic Aromatic Hydrocarbons (PAH)
 - Organophosphorus & Organochlorine Pesticides (OPP/OCP)
 - Polychlorinated Biphenyls (PCB)
 - Heavy Metals, *incl. Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc*
 - Asbestos
 - TRH Silica Gel Cleanup (SGC) testing
- > Development of a conceptual site model (CSM) based on the investigation findings.
- > Preparation of a report in general accordance with NSW EPA Consultants Reporting on Contaminated Land - Contaminated Land Guidelines (2020) [2], summarising the works undertaken and findings of the PSI.

The site investigation works associated with this investigation were undertaken in conjunction with a wider intrusive investigation program for the future Wine Country Drive (WCD) link road alignment.

3 Site Identification & Information

The future council lot development area (the 'site') is an irregular shaped parcel of land forming part of the proposed Huntlee New Town Stage 1 DA boundary modification ('Mod 25'), located at 1769 Wine Country Drive, North Rothbury.

The site locality to the defined site area and proposed Mod 25 boundary is depicted in Figure 3-1 below, and shown overlain on aerial imagery in Drawing D1, attached in Appendix A.

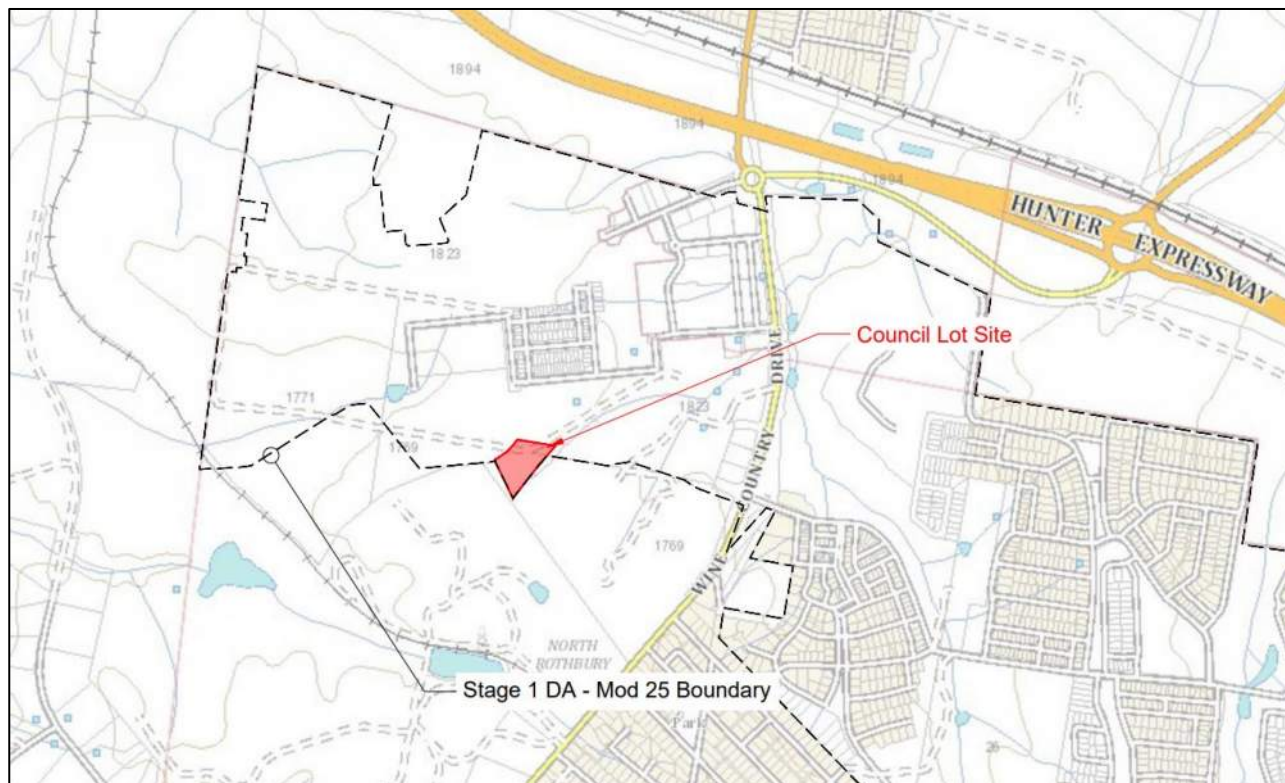


Figure 3-1 Huntlee Future Council Lot Site Locality

Relevant site information for the land constituting the site area is listed in Table 3-1 below.

Table 3-1 Site Details

Item	Description
Site Address	1769 Wine Country Drive, North Rothbury
Registered Lot	Part of residual Lot 696 DP1263808
Coordinates (approx. site centre)	E 344772 m, N 6383700 m (MGA Zone 56)
Current Owner	Huntlee Pty Ltd
Site Area	12,008 m ²
Elevation	Approx. 62-72 m AHD
Local Government Authority	Cessnock City Council
Land Zoning	MU1: Mixed Use
Assessment Trigger	Existing DA modification and future council lot development.
Current Site Use	Vacant

4 Site History Review

4.1 Previous Reports

Stantec has undertaken review of numerous previous assessment reports and documents carried out for the surrounding lands. Relevant data obtained from the previous reports have been utilised throughout this document to support this assessment, where appropriate.

The list of documents reviewed as part of this assessment are summarised in Table 4-1 below.

Table 4-1 List of reviewed documents

Document Title	Consultant / Author	Date & Ref
'Application to the State Pollution Control Commission to Modify the Existing Coal Handling and Preparation Facilities at Ayrfield No. 3 Colliery: Details of Proposed Environmental Safeguards'	James B. Croft and Associates (JCA)	1979 [4]
'Draft Preliminary Site Contamination Assessment - Landfill Near North Rothbury'	Unwelt (Australia)	October 1998 [5]
'Environmental Impact Statement - Land Remediation Works - Lot 24 DP 83089, Ayrfield Colliery No. 3, North Rothbury'	Hunter Development Brokerage (HDB)	February 2001 [6]
'Report on the Assessment of a Development Application (DA 27-02-01) Lodged Pursuant to Section 80 of the Environmental Planning and Assessment Act 1979'	NSW Department of Planning (PlanningNSW)	April 2002 [7]
'Environmental Audit and Phase 1 Contamination Assessment – Ayrfield Colliery, NSW'	Environmental Resources Management Australia (ERM)	September 2003 [8]
'Report on Preliminary Geotechnical Assessment, Hunter Valley Project, North Rothbury'	Douglas Partners (DP)	September 2003 [9]
'Report on Preliminary Assessment of Mine Spoil Stockpiles, Former Ayrfield No. 3 Colliery, Main Road, North Rothbury'	DP	April 2006 [10]
'Review of Existing Environmental Conditions and Chitter Emplacement Remediation, Ayrfield No. 3 Colliery, North Rothbury, NSW'	David Lane Associates (DLA)	June 2007 [11]
'Preliminary Environmental Site Assessment'	HLA Envirosciences (HLA)	November 2007 [12]
'Remediation and Rehabilitation Plan, Lot 1 DP 1042140 Main Road 220, North Rothbury'	AECOM	August 2009 [13]
'Mine Stability Assessment, Huntlee Town Centre'	RCA Australia (RCA)	November 2015 [14]
'Preliminary Assessment, Reuse of Mine Stockpiles'	Cardno Geotech Solutions (CGS)	May 2016 [15]
'Overview Remedial Action Plan – Proposed Huntlee Village 4'	RCA	November 2017 [16]
'Report on Detailed Site Investigation, 1729 & 1823 Wine Country Drive, North Rothbury'	Stantec	November 2023 [17]

4.2 Historical Title Deeds

Historical title deeds were not obtained for the lots forming the subject site and surrounds as part of this assessment. However, review of previous site assessments undertaken for adjacent areas and understanding of the current site history, occupations associated with former proprietors of the site and surrounding lands, are generally expected to comprise crop and livestock farmers / graziers, earthmoving contractors, mine operators, and landfill operators.

4.3 EPA Public Records Search

Review of NSW EPA's publicly available records within a 1000 m radius of the site was undertaken, with the relevant findings summarised below.

4.3.1 Contaminated Land Record of Notice

One contaminated land record of notice is reported within the defined radius, with details summarised in Table 4-2.

Table 4-2 Contaminated Land Record of Notice Details

Area No.	Notice No.	Issue Date	Notice Recipient	Site Name	Address	Distance from Site
3082	330 (current)	3/03/1993	Misthold Pty Ltd	Ayrfield Colliery	Main Road (now Wine Country Dr), North Rothbury	Offsite, 10-30 m south-west

The notice was issued under the Section 35 of the *Environmentally Hazardous Chemicals Act 1985* and related to believed environmental degradation associated with acid surface and ground water, generated from the coal washery reject spoil within the former Ayrfield No. 3 Colliery site.

NSW EPA issued direction to develop a management program to control the generation of acid water, erosion of the CWR stockpiles, and subsequent loading of local streams and river systems. The management plan was to include the following activities:

- > Control of existing erosion and reduction of future erosion, via slope stabilisation, contouring runoff control, and vegetation cover.
- > Diversion of all uncontaminated water falling on to the site to prevent contact with water with low pH or high sediment loadings.
- > Centralising all acid water flows to a single (or series of) control dam/s, and reducing of water acidity via aeration, neutralising agents, lime bed construction, or bioremediation strategies.

4.3.2 PoEO Public Register

Two current and one former ('revoked') licensed activities under the POEO Act (1997) within the defined radius, with details listed in Table 4-3 below.

Table 4-3 POEO Licensed Activities – Current & Revoked

License No.	Organisation	Location	Issue Date	Activity	Distance from Site
4708 (current)	CCC	Waters within Cessnock LGA	21/08/2000	application of herbicides	onsite / offsite ⁽¹⁾
3142 (current)	ARTC	ARTC Network	20/12/2000	railway infrastructure operations	offsite (500m south) ⁽²⁾
11680 (revoked)	Leaway Pty Ltd C/- Robert Whitton Administrators	Ayrfield Colliery	30/08/2002	landfilling in designated areas	offsite (> ~10 m west)

Notes:

(1) Connected system of gullies and riparian zones ultimately discharging into Black and Anvil Creek.

(2) Relates to the disused branch of the Main North rail line, formerly servicing the Ayrfield Colliery.

The search also revealed four notices issued by the EPA with respect to the former (revoked) Leaway landfilling licensed activity at the Ayrfield No. 3 Colliery (license no. 11680), with details listed in Table 4-4.

Table 4-4 EPA Notices to Licensed Activity No. 11680 – Leaway Landfill

Notice No.	Notice Type	Date	Notice Details
1050658	s.91 Clean Up Notice	9/08/2005	The notice was issued in response to a fire occurring within the landfilled waste, reportedly impacting surrounding residential areas. EPA issued direction to take clean-up action, including: ▪ Extinguishing of landfill fire, with maintenance of landfill material to prevent exposure to atmosphere i.e. preventing emission of smoke and odour. ▪ Installation of temporary erosion and sediment control works, preventing sediment laden stormwater runoff. ▪ Stabilisation of landfill materials via the use of hydroseeding (or similar) to control dust emission and erosion of sediment. ▪ Provision of regular monitoring of the landfill.
1052068	s.79 Suspension of a Licence	11/10/2005	Notice of licence suspension issued by EPA due to non-compliance with the conditions of the license, including: ▪ No provision of financial assurances for remedial works, site remediation and post closure care in the event of licensee abandoning the site or insolvency. ▪ No effective engineered landfill leachate barrier installed within landfill cells. ▪ Receiving of non-approved waste materials at the landfill facility. ▪ Non-conformance to filling plan nominated in licence conditions.

Notice No.	Notice Type	Date	Notice Details
			EPA issued direction to rectify non-compliance prior to any further waste being received at the facility, generally relating to the following: - Cost estimations for site remediation and post closure works, following cessation of waste receipt. - Works to minimise the generation of leachate, including management of leachate. - Capping of landfilled cells in a manner minimising the risk of spontaneous combustion and controlling the release of landfill gas. - Other matters pertaining to filling operations, dust emissions, erosion/sediment control, monitoring, waste screening etc.
1053624	s.55 License Transfer Refusal	29/11/2005	Notice of refusal of licence transfer application issued by the EPA. Although not stated in the notice, it is expected that the transfer application was refused due to failure to rectify previous non-compliance outlined within the above suspension notice (no. 1052068).
1067561	s.79 Revocation of a Licence	18/1/2007	Notice of revocation of licence issued by the EPA. No details on the revocation are listed within the notice document.

4.3.3 Other EPA Records

Review other publicly available EPA records for the relevant lots and depositional plots that constitute the site area, indicated the following:

- > Excluding the above no other records of any contaminated sites notified to the EPA within the defined radius.
- > No records of any delicensed activities still regulated by the EPA within the defined radius.
- > No records of any former gasworks sites within the defined radius.
- > No records of any sites part of the EPAs PFAS investigation program within the defined radius.

4.4 Historical Aerial Review

Review of available historical aerial imagery / photographs of site and surrounds was undertaken (500 m radius), with inferred site features and activities summarised in Table 4-5 below. Aerial imagery / photographs are attached in Appendix B.

Table 4-5 Summary of Aerial Imagery Review

Date	Onsite	Offsite
1961 (black & white)	- Site area mostly undisturbed, comprising predominantly undeveloped bushlands. - Tracings of possible access tracks spanning through the site.	- Predominantly undeveloped bushlands to the north, east and west, with some evidence of disturbance / reduced vegetation to the east within the location of the former quarry. - Main Road (<i>now Wine Country Drive</i>) and North Rothbury township to the east and south-east. - Ayrfield No. 3 colliery to the south, including disturbed lands immediately adjacent to the south. The following is evident within the colliery: - Numerous colliery structures, associated with mining and washery operations. - Several colliery dams associated with storage of site drainage and tailings. - Private rail spur for raw coal movements. - West trending tributary of Black Creek to the south, with two of the existing colliery dams constructed online. - Administrative and residential structures further to the south.
1974 (black & white)	Generally consistent with 1961 aerial photograph.	- Further disturbance / clearing to the west of site within the former quarry area. - Extent of disturbance associated with the southern colliery has expanded further to the north-west. - The overall colliery landform to the south appears to have changed, related to ongoing operations and material movements, with some former tailings dams appeared to be removed or discontinued.
1976 (colour)	Generally consistent with 1974 aerial photograph.	Generally consistent with 1974 aerial photograph.

Date	Onsite	Offsite
1978 (black & white)	Disturbance and/or vegetation removal to the approximate western third of the subject site area. The disturbance appears to be related to the adjoining construction of the coal fines tailings cells immediately west.	- Expansion to the coal washery operations within the colliery site has occurred, including: - Construction of several new structures associated with the coal handling and preparation plant to the south. - Construction of numerous coal fine tailing cells immediately west of the site. The cells appeared empty at the time of the aerial photograph. - Probable coal and/or reject stockpiling areas to the south. - Further disturbance and clearing to the former quarry area to the east of site.
1984 (black & white)	Generally consistent with 1979 aerial photograph, excluding some additional extent of disturbance to the site area evident (approximate western half).	- Previously constructed cells to the west filled with probable coal tailings. - Rural farm dam constructed to the north-west. - Probable CWR materials emplaced within the disturbed quarry area to the east. - Dumping / stockpiling of coal wash reject materials to the south of the private rail spur (and south of site) commenced.
1989 (colour)	- Generally consistent with 1984 aerial photograph. - Possible ponding / damming of water within disturbed site area, in the central portion of the site. - Minor clearing of bushland along the northern boundary.	- Generally consistent with 1984 aerial photograph. - Limited clearing to the bushlands north of the site, and construction of a rural farm dam.
1990 (colour)	- Generally consistent with 1989 aerial photograph, no ponded / dammed water evident. - Further clearing of bushland to minor northern portion of the site.	- Colliery operations to the south appear to have ceased. - Majority of the former colliery structures have been demolished / removed, however remnant of several of the former structures remain. - Further clearing to the undeveloped bushland to the north.
1994 (colour)	- Generally consistent with 1990 aerial photograph. - Further clearing within the northern portion of the site, forming part of a rural pasture.	- Predominantly consistent with 1990 aerial photograph. - Storage of old rolling stock along rail spur to the south of site. - Further clearing to the undeveloped bushlands to the north, forming a rural maintained pasture. - Landfilling operation to a former tailings cell evident to the south of site, understood to be associated with the colliery cleanup.
1998 (colour)	Generally consistent with 1994 aerial photograph.	- Predominantly consistent with 1994 aerial photograph, with exception to: - Construction of two rail maintenance sheds to the south of site. - Construction of a rural residential property to the north.
2004 (colour)	Generally consistent with 1998 aerial photograph.	- Probable landfilling to the former tailings cells evident immediately west of the site, likely related to the previous proposal to remediate the cells as described in HDB (2001) [6]. - Earthworks operations within the existing site CWR materials to the south of site, including evidence of both excavation and fill operations.
2006 (colour)	Generally consistent with 2004 aerial photograph.	Generally consistent with 2004 aerial photograph, with further extent of earthworks within the colliery CWR materials evident to the south.
2007 (colour)	Generally consistent with 2006 aerial photograph.	Generally consistent with 2006 aerial photograph.
2009 (colour)	Generally consistent with 2007 aerial photograph.	Generally consistent with 2007 aerial photograph.
2010 (colour)	Generally consistent with 2009 aerial photograph.	Generally consistent with 2009 aerial photograph.
2015 (colour)	Generally consistent with 2010 aerial photograph.	Generally consistent with 2010 aerial photograph, with civil construction works to Wine Country Dr and the Katherine's Landing residential estate underway to the east, related to the Huntlee development.
2020 (colour)	Generally consistent with 2015 aerial photograph.	Generally consistent with 2015 aerial photograph, with construction to stages of Town Centre, Wine Country Dr, and the Katherine's Landing of the Huntlee development either finished or in progress.

Date	Onsite	Offsite
2023 (colour)	Generally consistent with 2020 aerial photograph.	Generally consistent with 2020 aerial photograph, with further civil construction to Town Centre development stages to the north.
2025 (colour)	Generally consistent with 2023 aerial photograph.	Generally consistent with 2023 aerial photograph, with continued civil, residential, and commercial construction to the Town Centre development stages to the north.

Aerial Sources:

1961-1998: NSW Government's online resource 'Historical Imagery Viewer'

2004-2009 'Google Earth' satellite imagery

2010-onwards: 'nearmap' satellite imagery

4.5 Summary of Site History

4.5.1 Onsite

Review of the available site history data indicates that from 1961 to 1976, the subject site area generally comprised undeveloped bushlands. Disturbance to the western portion of the site occurred in approximately 1978 coincident with the expansion works to the onsite coal handling and preparation plant to the south, which included the construction of several coal tailings ponds / cells immediately adjacent the western site boundary. The eastern portion of the subject site has appeared to remain relatively undisturbed from 1961 to 2024.

4.5.2 Offsite

4.5.2.1 Ayrfield No. 3 Colliery

The former Ayrfield No. 3 Colliery ('colliery') is located immediately adjacent the subject site area to the south and west orientations.

Operations at the colliery originally commenced in the early 1890s, with the original washery plant established onsite in the early 1900s, predominantly handling coal mine from the onsite underground operation. By 1974, underground mining at the colliery ceased with all underground entrances sealed to prevent entry.

The onsite washery plant was further expanded by 1978 in order to receive raw coal from a then new open cut mine located in Mt Thorley. The washery expansion also included the construction of several froth floatation cells for coal fines treatment, which are offset from the subject site's south-western boundary. The washery plant operations was discontinued in 1985.

Following all mining and washery operations within the colliery site, the colliery site was generally used for locomotive maintenance / restoration, and landfill operations within the disused coal tailings ponds / cells immediately west of the subject site. Earlier landfilling operations were related to the original colliery cleanup, with later landfilling undertaken as a licensed operation, with the tailings cells intended to be remediated via backfilling with received soil and inert building related waste from construction sites throughout the Hunter.

With exception of opportunistic fly tipping within the colliery, all major site changes / operations were generally complete by approximately 2007.

4.5.2.2 Former Quarry

The former quarry site is located immediately adjacent the subject site area, generally to the east.

Significant site disturbance within the quarry site occurred by 1974, with some minor disturbance / reduced vegetation growth within the quarry envelope evident within the 1961 aerial photograph. Limited information on the operations at the quarry are available, however, it is understood the quarry was predominantly used for gravel extraction.

Recent investigations undertaken by Stantec (2023) [17], has indicated significant quantities of uncontrolled filling within the quarry area, comprising a mixture of overburden materials, CWR materials, and miscellaneous waste backfilled within an area of the quarry void.

The site is currently generally used for stockpiling of surplus site-won materials and construction materials from various stages of the Huntlee development.

4.5.2.3 *Remaining Areas*

The remainder of the site surrounds outside of the former colliery and quarry sites, predominantly comprised undeveloped bushlands and rural residential properties from 1961. Periodic site changes generally comprised localised clearing for rural properties and further residential developments. Civil construction activities for the overall Huntlee development commenced in 2014, with the initial construction works occurring to sections of Wine Country Drive and residential development stages to the east (*'Katherine's Landing'*)

5 Site Condition & Surrounding Environment

5.1 Topography & Drainage

Regionally, the overall site is set within gently undulating terrain and characterised by a network of gullies and tributaries within the Anvil Creek catchment.

Approximately 40% of the subject site is positioned within a heavily disturbed landform related to possible former extractive activities, with the terrain comprising variable site slopes ranging from near-level grades to steep cut faces along parts of disturbed perimeter.

The remaining site area generally comprises land of minimal disturbance, appearing to be close to native terrain. A shallow intermittent overland flow path trending north-east, is noted just inside the eastern site boundary.

The generalised areas of minimal and heavy site disturbance are shown in Figure 5-1 below.

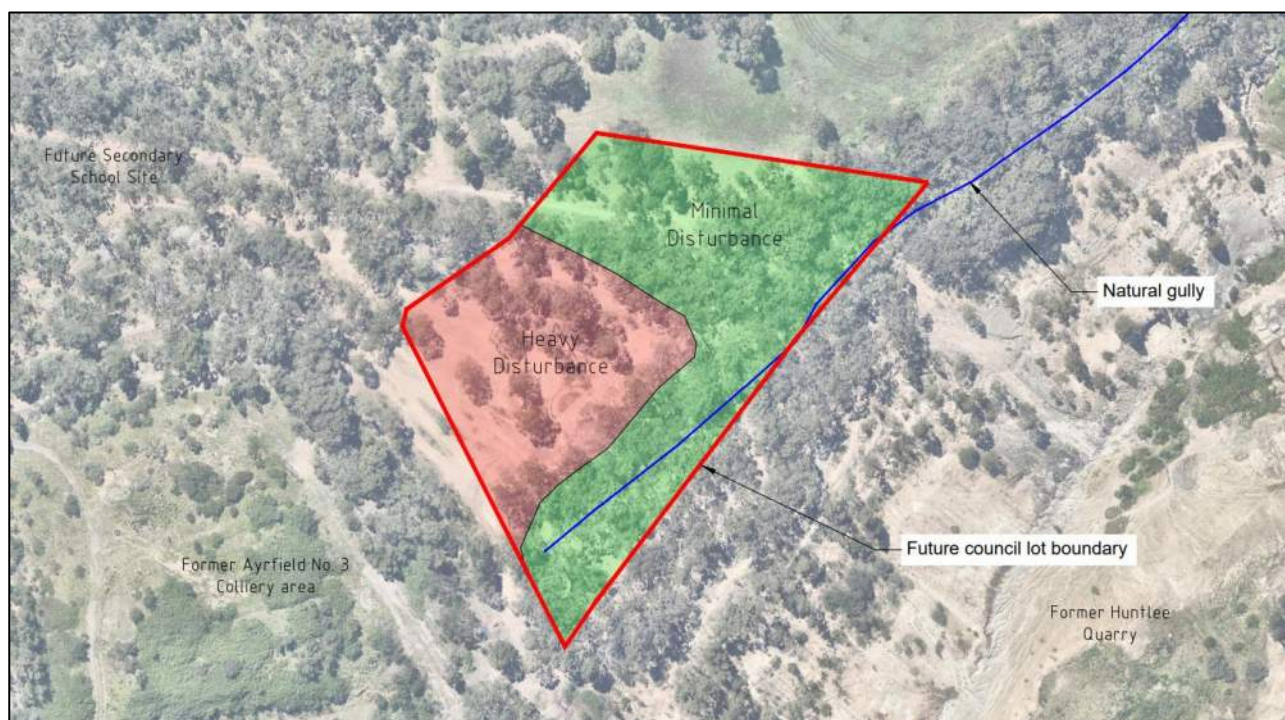


Figure 5-1 Areas of site disturbance

Whilst a significant component of site has been altered by former activities, site slopes ultimately fall towards the east and north-east, generally towards the natural gully. Elevations (AHD) across the site generally range from approximately 62 to 72 m, with the north-west boundary and southern site corner noted to be elevated points of the site.

Drainage to the site comprises predominantly overland flows in the direction of the existing site slopes and natural gully, generally to the north-east offsite.

Topographic site contours developed from LiDAR and alignment of the natural gully are shown overlaid on aerial imagery in Drawing D2 in Appendix A.

5.2 Soil Landscape

Reference to the *Soil and Land Resources of Central and Eastern NSW* dataset [18] indicates that most of the site area comprises disturbed landform, appearing to be related to possible former extractive operations. The reported *Disturbed Terrain (xxz)* landscape is generally defined as heavily disturbed land arising from human activity, with features of the original landform extensively modified.

A minor eastern portion of the site is noted to be within the erosional landform *Wallalong (wgx)*, which is typically characterised by gently undulating rises to undulating low hills on Permian-aged sedimentary formations of the Maitland and Dalwood Groups.

5.3 Geology

Reference to the Newcastle Coalfield Regional Geology [19] map, indicates the site is underlain by the *Branxton Formation* (Pmb) of the *Maitland Group*, which is known to comprise conglomerate, sandstone, and siltstone.

5.4 Hydrogeology

5.4.1 Aquifer Setting

Reference of the *Hydrogeology of Australia* [20] map indicates the site is located within a hydrogeological setting comprising of fractured or fissured, extensive aquifers of low to moderate productivity.

5.4.2 Groundwater Bore Data

Initial review of the WaterNSW Groundwater Database did not indicate the presence of any active or discontinued groundwater bores in proximity to the subject site.

Additional to the publicly available groundwater information, review of a previous groundwater investigation conducted by RCA (2015) [14] and Stantec (2023) [17], to the east of the site area was undertaken. Groundwater levels encountered during the previous investigations are summarised in Table 5-1 below.

Table 5-1 Summary of Available Groundwater Data

Bore ID	Date	Bore Collar RL (m AHD)	Bore Depth (m BGL)	GW Depth ⁽¹⁾ (m bgl)	GW RL (m AHD)	Water Bearing Zone	General Locality
<i>RCA (2015) Investigation [14]</i>							
BH102	18/08/15	48.4	26.7	13.1	35.3	Bedrock	375m north-east
BH106	19/08/15	50.3	9.1	7.9	42.4	Bedrock	275m north-east
BH107	19/08/15	50.2	11.8	10.2	40.0	Bedrock	275m north-east
BH108	19/08/15	50.3	13.5	9.0	41.3	Bedrock	275m north-east
BH123	21/08/15	56.0	31.4	23.5	32.5	Bedrock	225m north-east
<i>Stantec (2023) Investigation [17]</i>							
MW01	30/08/22	53.9	16.5	13.5	40.4	Bedrock	285m east
MW02	30/08/22	51.7	15.7	12.0	39.7	Bedrock	220m north-east
MW03	31/3/22	76.0	20.5	NE (>20.5 m)	NE (<55.5 m)	NE	150m south-east
MW04	31/08/22	66.5	15.9	9.8	56.7	Bedrock	250m south-east
MW05	3/04/23	69.9	27.7	18.5	51.4	Bedrock	100m east
MW05a	5/4/23	73.4	37.6	NE (>37.6 m)	NE (<35.8 m)	NE	160m south-east
MW06	3/04/23	66.8	20.2	18.5	48.3	Bedrock	290m south-east

Notes:

m AHD metres above Australian Height Datum

m BGL metres below ground / bore collar level

(1) Definition by first indication of moisture during drilling of groundwater borehole.

5.5 Acid Sulphate Soils

Review of the NSW *Acid Sulphate Soils (ASS) Risk* dataset [21] indicates the site is not located within a mapped area of probable ASS occurrence.

Stantec (*and former entities*) have previously undertaken preliminary assessment of acid sulphate soils across the overall Huntlee development and within the current subject site, as part of stage-by-stage geotechnical investigations. In the main, subsurface soils are generally noted to be naturally acidic in nature, however not considered to be potential or actual acid sulfate soils based on low levels of oxidisable sulphur content reported in detailed laboratory testing.

Further commentary on acid sulfate soils has been provided under a separate report cover as part of a preliminary geotechnical assessment for the site (ref. 304001022-014.1, dated. 03/07/2025).

5.6 Site Features

Site inspection was conducted concurrent to intrusive investigation works on 23 May 2024 by a geotechnical engineer and principal geotechnical consultant from Stantec. Inspection generally comprised a visual appraisal of the overall site, including recording and photography of salient site conditions and features. Relevant site features and observations are listed in Table 5-2 below, with supporting site photographs included in the below figures.

Table 5-2 Summary of Site Features and Observations

Item	Observations
Site use	- The land is currently vacant and predominantly comprises a mixture of undeveloped and heavily disturbed lands, probably associated with former extractive activities. - The site is presently used, informally, for recreational motor bike activities.
Nearby water bodies	- No water bodies observed on site. - A shallow natural gully trending generally north within the eastern portion of site, directing overland flows offsite.
Site surface coverings	- The heavily disturbed portion of the site is generally devoid of vegetation. - The generally undeveloped ('minimally disturbed') areas of the site mostly comprised native bushlands, with mature trees and scrub. - Generally maintained grass is present to a minor northern portion of the site, associated with the former Huntlee Academy site extents.
Surface soils / materials	- Granular topsoils and colluvium, overlying the residual clay and weathered rock strata, in minimally disturbed areas of the site. - Exposed weathered siltstone/sandstone bedrock, with shallow slopewash coverage with heavily disturbed site areas (see Figure 5-2 below). - Exposed natural colluvium, residual clays, and weathered rock in several exposed cut faces. - Several small, isolated mounds / berms comprising overburden uncontrolled fill materials. - Minor surficial fragments of coal wash reject materials within the south-western portion of the site, associated with the nearby colliery. No significant or appreciable volumes of CWR materials were observed within the site extent. - Minor isolated scattered foreign materials, including pipe work and disused tyres.
Site cut and fill	- Extensive cutting to the heavily disturbed site area, with excavations in excess of 1.0m below former rock head level observed in areas consistent with quarry activities. - Filled mounds / berms of overburden materials used for recreational motor bike activities (see Figure 5-4 below). - No significant volumes of CWR fill materials were observed within the site extents. However, larger volumes of CWR materials were observed/encountered offsite within the nearby colliery area. - Significant cutting and uncontrolled fill materials to the west and south associated with the discontinued colliery and quarry sites.
Buildings / structures	- Nil observed onsite. - The perimeter of the former Huntlee Academy site is bounded by existing barb wire fencing, generally within the northern extents of the site.
Roads / access tracks	Several formed access tracks and motor bike trails through the site area and surrounds.
Stockpiles, fly tipping, and/or anthropogenic materials	- Numerous soil stockpiles comprised of predominantly overburden materials e.g. residual soils and weathered rock. - Scattered foreign material, commonly timber, tree stumps, disused tyres, old pipework, generally in low overall volumes.
Potential Asbestos Containing Material	Old discarded pipe, lined with fibrous material. Subsequent laboratory testing confirmed the presence of asbestos fibres in the lining (see Figure 5-3below).
ASTs / USTs	Nil observed.
Evidence of land contamination (staining or odours)	- Presence of potential uncontrolled fill and anthropogenic materials across the site. - Significant land disturbance associated with possible former extractive activities. - Historical colliery and landfill operations west adjacent to the site, with coal wash reject materials noted within the site area. - No visual staining or olfactory evidence of gross contamination observed within the subject site boundary.

Item	Observations
Other Observations	▪ No visual indicators for acid sulfate or saline soils. ▪ No indications of groundwater use onsite. ▪ No liquid waste disposal features observed. ▪ No dangerous goods observed. ▪ Erosion / rutting observed within drainage lines and bare areas of site.



Figure 5-2 General view of heavily disturbed site area - looking south

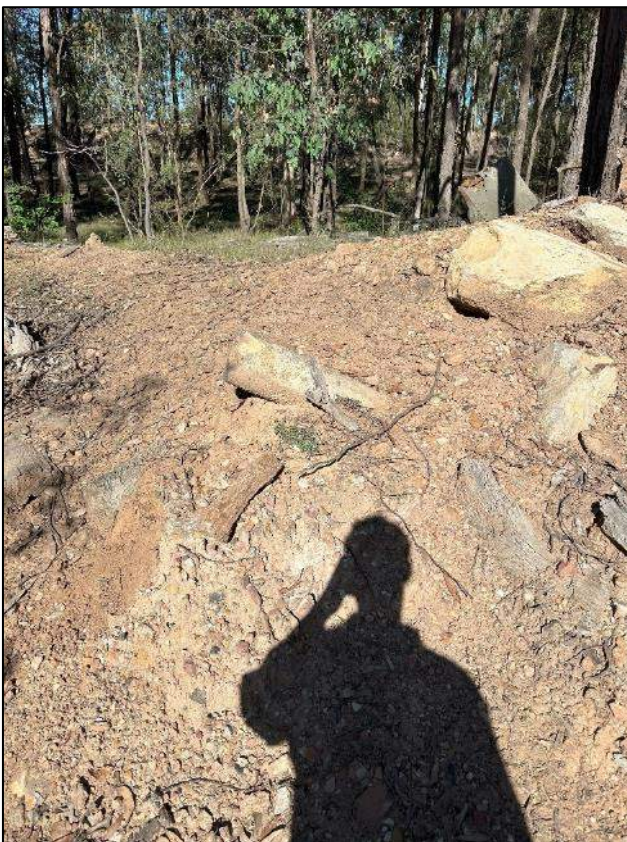


Figure 5-3 Old pipe embedded within overburden fill pile ('ACM01') - looking south-east



Figure 5-4 Typical existing overburden fill pile overlying in-situ residual soils and weathered materials ('TPCL02') - looking south

5.7 Surrounding Land Use

Land uses to the site surrounds are generally summarised in Table 5-3 below.

Table 5-3 Surrounding Land Use / Activities

Direction	Land Use or Activity
North	- Open-pasture associated with the former Huntlee Academy site and undeveloped bushland designated for the future Huntlee secondary school site to the north. - Existing and current stages of the Huntlee Town Centre development further to the north.
East	- Former quarry site to the south and east, with an existing fill berm comprising overburden materials noted to border the eastern site boundary. - Vacant undeveloped lands and Wine Country Dr further to the east.
South	The overall former Ayrfield No. 3 Colliery site.
West	Former coal tailings / landfill cells to the west, embedded within the overall colliery site.

Based on the desktop review of site history data, inspection, and previous/current intrusive investigations, the offsite areas comprising significant uncontrolled filling associated with the nearby quarry and colliery sites, which are noted to include a combination of overburden materials, coal wash rejects, and landfill waste, are generally considered to be clear of the subject site area.

6 Assessment Criteria

The assessment criteria used in NSW to evaluate soil analytical results are based on the National Environment Protection (Assessment of Site Contamination) Measure 1999 (*revised 2013*) 'NEPM (2013)' [1]. Schedule B(1) of the NEPM (2013), *Guideline on Investigation Levels for Soil and Groundwater*, outlines default health- and ecological-based investigation and screening levels for contaminants of concern, based on generalised exposure scenarios.

In the absence of confirmation of future site use to the council lot, an assumed future land-use setting consistent with urban residential development (*Residential A*) has been considered in accordance with Schedule B(1) of the NEPM (2013) [1].

The following criteria were considered:

- > Health Investigation Levels (HILs) for soils within residential developments with accessible soils (HIL A).
- > Health Screening Levels (HSLs) for vapour intrusion within low density residential developments (HSL A).
- > Ecological Investigation Levels (EILs) for urban residential and public open space limits. The thresholds adopted are conservative ACL values from Table 1B(1) to 1B(3) NEPM.
- > Ecological Screening Levels (ESLs) for soils within urban residential and public open space areas.

The composition of the materials assessed, generally comprising predominantly overburden materials, granular topsoils and colluvium, sand to gravel sized coal wash reject materials, and variable soil matrix within landfilling areas. Given the assessed materials were predominantly granular, albeit variable, HSLs and ESLs for sand-type soils have been considered for this preliminary assessment, which is noted to be the conservative approach.

The investigation or screening levels presented in the NEPM are not intended to be interpreted as either maximum permissible levels, clean-up levels, or safe levels. Rather they are levels at which further investigation or assessment should be undertaken to provide assurance that unacceptable contamination does not occur to an extent that could cause harm or detriment for users of the land. Subsequent assessment on a site-specific basis often results in higher levels being acceptable. However, since the investigation and screening levels are generally set at conservatively low levels, they are often taken to be the acceptable levels.

7 Field Investigation Methodology

7.1 Soil Sampling

Field investigation for the future council lot site was undertaken in conjunction with a larger investigation program for the future link road connecting Wine Country Dr to the future Secondary School site. The future council lot site, the subject of this assessment, was embedded within the overall investigation area.

The overall link road investigation works were initially undertaken between 23 and 30 May 2024 and comprised the excavation of approximately 60 test pit/bore locations utilising a large capacity excavator and hand equipment (e.g. hand auger / tools). A total of 10 intrusive test locations were advanced within and nearby the current subject site, including TPCL01-07, HACL01-03, with environmental soil sampling selectively carried out. Recovery of a fragment of fibrous lining to a discarded pipe was also undertaken (ACM01).

A further limited surface soil sampling was conducted on 29 October 2024 to assess the potential for contamination surface migration entering the site from the upgradient colliery site. The further sampling comprised the collection of near-surface samples at 4 discrete locations (ES-CL01 to ES-CL04) in proximity to the western site boundary and sampled using hand equipment.

All environmental samples were collected using a new set of disposable gloves for each sample to prevent cross contamination. Samples were collected within laboratory supplied containers, were immediately chilled following sampling and during transport to the laboratory and dispatched to the laboratory within the recommended holding times.

Investigation or sampling locations conducted both within and in proximity to the subject site boundary are shown in Drawing D3, attached in Appendix A.

7.2 Laboratory Testing

From the collected environmental soil samples and fragments, the following laboratory analysis was undertaken:

- > Total Recoverable Hydrocarbons (TRH), with additional Silica Gel Cleanup (SGC) testing undertaken on samples with detections in TRH.
- > Polycyclic Aromatic Hydrocarbons (PAH)
- > Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene (BTEXN).
- > Organochlorine pesticides (OCP) and organophosphate pesticides (OPP).
- > Heavy metals, incl. As, Cd, Cr, Cu, Pb, Hg, Ni and Zn, with 2 samples also tested for Selenium with inclusions of coal wash reject materials.
- > Polychlorinated Biphenyls (PCB).
- > Asbestos ID tests.

The sampling and laboratory analysis undertaken, including associated rationale, is summarised Table 7-1 below.

All laboratory analysis was undertaken by an external NATA-accredited chemical testing laboratory.

Table 7-1 Sampling and Laboratory Analysis Strategy

Sample ID	Depth (m)	Media	Chemical Analytes	Rationale / Comment
ACM01	-	Fragment	Asbestos ID	Fibrous lining material of old disused pipe onsite.
HACL02	0.05 - 0.10	Soil	TRH, PAH, BTEXN, Heavy Metals, OCP/OPP, SGC	Surficial soils within natural overland flow path, down gradient of western colliery site.
HACL03	0.05 - 0.10	Soil	TRH, PAH, BTEXN, Heavy Metals, OCP/OPP	Surficial slope wash materials within preferential flow path, down gradient of heavily disturbed site area.

Sample ID	Depth (m)	Media	Chemical Analytes	Rationale / Comment
TPCL04 (<i>offsite</i>)	2.80 - 2.90	Soil	TRH, PAH, BTEXN, Heavy Metals, OCP/OPP, SGC	Sampling of constructed batter comprising coal wash reject materials, upgradient of the site area adjacent to the west (<i>offsite</i>).
ES-CL01	0.05 - 0.10	Soil	TRH, PAH, BTEXN, Heavy Metals, OCP/OPP, PCB, SGC	Sampling undertaken either on the western site boundary or within the region between the former colliery and the site, for the purpose of assessing surface migration of any potential contamination.
ES-CL02 (<i>offsite</i>)	0.05 - 0.10			
ES-CL03 (<i>offsite</i>)	0.05 - 0.10			
ES-CL04 (<i>offsite</i>)	0.05 - 0.10			

8 Areas & Contaminants of Potential Concern

Following the findings of the site inspection and desktop review of available site history information and previous investigation data, potential sources of contamination and associated contaminants of potential concern (COPC) were identified, summarised in Table 8-1 (onsite sources) and Table 8-2 (offsite sources) below.

Table 8-1 Potential Contamination Sources & Contaminants of Potential Concern - Onsite Sources

Area of Concern	Potential Source	Details	COPC	Comment / Status
On-Site Sources				
Heavily disturbed western portion of the site	Possible former extractive activities	Extraction processes - machinery use	- Heavy Metals - PAH, TRH, BTEXN	Possible use of heavy machinery onsite associated with former extractive activities, with potential for oil spill / leaks during operation or refuelling
	Uncontrolled filling	Several fill berms, mounds, access tracks on site	- Heavy Metals - PAH, TRH, BTEXN - OCP/OPP	- Numerous filled berms/mounds and tracks currently used for recreational motor bike activities. - Fill materials predominantly comprised overburden materials mostly consistent with a weathered siltstone/sandstone. - Some small piles of surficial topsoils were also observed.
Possible western extent of site	Coal wash reject materials	Surficial CWR materials with potential point source contamination from various components of the former CHPP operations.	- Heavy metals - PAH, TRH, BTEXN - PCB	Surficial observations of minor CWR materials along the western boundary. Based on the investigation and site observations, volumes of CWR materials onsite are expected to be minor and limited to surficial occurrences.
Overall site area	Fly tipping	Potential hazardous materials present on site or remnant materials impacting surface soils.	- Heavy metals - PAH, TRH, BTEXN - Asbestos - Foreign materials	- Illegal dumping / fly tipping was generally minor across the site, with generally old tyres, timber, tree stumps, and old pipework observed locally. - Asbestos was positively identified within the exterior lining material to an old, discarded pipe (sample ACM01), discussed in Section 9.2.

Table 8-2 Potential Contamination Sources & Contaminants of Potential Concern - Onsite Sources

Area of Concern	Potential Source	Details	COPC	Comment / Status
Off-Site Sources				
Overall Former Ayrfield No. 3 Colliery (west) & Former quarry site (south)	Numerous historical industrial operations within the colliery site	- Hazardous building materials within existing/demolished colliery structures or within surficial soils - Fuel / oil storage and use, including potential for storage tanks and machinery maintenance / refuelling. - Landfilling of former tailings ponds and parts of the former quarry void. - Coal wash reject materials impacted by point source contamination from various components of the former CHPP operations. - Rail yard, including locomotive restoration and maintenance operations - Fly tipping / illegal dumping - General historic earthworks and extractive activities.	- PAH, TRH, BTEXN - Heavy metals - OCP/OPP - PCBs - Asbestos - PFAS - Landfill gas	- Numerous sources of potential contamination across the overall colliery and quarry sites associated with former industrial operations, simplified herein. - Several of the sources are noted to be generally down-gradient of the subject site, and unlikely to impact the subject site. However, landfilling (waste) operations to the former tailings ponds and significant volumes of coal wash reject and other uncontrolled overburden fill materials were observed in proximity to the subject site area to the west and south. - Stantec has undertaken sampling of surface soils in proximity to the western site boundary and within an existing overland flow path as part of this investigation to assess for the potential of lateral migration of any contaminant of concern.

9 Investigation Findings

9.1 Subsurface Conditions

The encountered surface and subsurface conditions encountered during the intrusive investigation are summarised below and detailed in the attached engineering logs in Appendix C.

9.1.1 Natural Profile

Within the areas of minimal site disturbance, natural subsurface conditions generally comprised shallow silty sand topsoils and colluvium, overlying residual silty to silty sandy clays grading to weathered siltstone and sandstone. The site areas subject to heavy disturbance, possibly related to former extractive activities, mostly comprised exposed siltstone/sandstone bedrock, with a thin cover of slopewash material in areas.

It is noted that natural ground conditions, both minimally and heavily disturbed, generally formed the majority of the subject site area.

9.1.2 Uncontrolled Filling

Uncontrolled fill materials were encountered in isolated areas across the subject site, however predominant within the heavily disturbed portion of the site. Uncontrolled filling was generally comprised small soil stockpiles and berms / mounds with observed materials comprising:

- > Natural overburden materials, consisting of clayey to clayey gravelly sand likely derived from site-won weathered rock materials, and silty sand materials of similar surficial topsoils and colluvium.
- > Minor surficial observations of coal wash materials towards the western site extent. CWR occurrences within the site extent were predominantly minor surficial fragments, with significant volumes not observed.

Further to the fill materials observed onsite, the colliery site to the west and the former quarry to the south which border the subject site comprises significant volumes of uncontrolled fill materials, comprising a mixture of coal wash rejects, natural overburden materials, and waste materials associated with historic landfilling operations. The significant volumes of uncontrolled fill materials associated with the sites are noted to occur outside of the subject site boundary.

9.2 Laboratory Results

The results of the chemical laboratory analysis have been compared against the adopted health and ecological-based assessment criteria (refer Section 6) and summarised below. Summary tables comparing the laboratory results against the adopted soil criteria is attached in Appendix E, with the raw NATA-endorsed laboratory report sheets attached in Appendix D.

9.2.1 Total Recoverable Hydrocarbons (TRH)

Initial TRH testing indicated numerous minor hydrocarbon detections for the C10-C16, C16-C34, and C34-C40 detections, with several of the detections exceeding the adopted ecological-based screening levels and one sample in exceedance of the health-based screening level.

Additional Silica Gel Cleanup (SGC) was undertaken on all samples with initial detections for TRH, with the subsequent results either reporting detections below the laboratory reporting limits or below the adopted health and ecological-based criteria. It is also noted that residual detections in TRH concentrations following SGC, albeit below threshold limits, were all from samples collected outside the subject site boundary. The initial TRH exceedances and subsequent SGC testing results are summarised in Table 9-1 below.

Table 9-1 Summary of Initial TRH Exceedances & Silica Gel Cleanup Results

Analytes	Adopted Criteria	Sample ID & TRH Concentration - Before SGC	Sample ID & TRH Concentration - After SGC
C10-C16	120 mg/kg (ESL)	▪ ES-CL03 (<i>offsite</i>) - 170 mg/kg > ESL/HSL	▪ ES-CL03 (<i>offsite</i>) - 82 mg/kg < ESL/HSL
	110 mg/kg (HSL)		
C16-C34	300 mg/kg (ESL)	▪ HACL02 - 400 mg/kg > ESL ▪ TPCL04 (<i>offsite</i>) - 580 mg/kg > ESL ▪ ES-CL02 (<i>offsite</i>) - 370 mg/kg > ESL ▪ ES-CL03 (<i>offsite</i>) - 900 mg/kg > ESL ▪ ES-CL04 (<i>offsite</i>) - 420 mg/kg > ESL	▪ HACL02 - <100 mg/kg (LOR) <ESL ▪ TPCL04 (<i>offsite</i>) - 210 mg/kg <ESL ▪ ES-CL02 (<i>offsite</i>) - 120 mg/kg <ESL ▪ ES-CL03 (<i>offsite</i>) - 290 mg/kg <ESL ▪ ES-CL04 (<i>offsite</i>) - 190 mg/kg <ESL

9.2.2 Benzene Toluene Ethylbenzene Xylenes and Naphthalene (BTEXN)

All BTEXN concentrations were below the laboratory limit of reporting (LOR and the adopted health and ecological-based threshold limits.

9.2.3 Polycyclic Aromatic Hydrocarbon (PAH)

All PAH concentrations were either at low levels or below the LOR, with all PAH detections generally well below the adopted health and ecological-based threshold limits.

9.2.4 Heavy Metals

All heavy metal concentrations were either at low levels or below the LOR, with all heavy metal detections generally well below the adopted health and ecological-based threshold limits.

9.2.5 Organophosphorus & Organochlorine Pesticides (OPP/OCP)

All OPP/OCP concentrations were below the laboratory LOR and the adopted health and ecological-based threshold limits.

9.2.6 Polychlorinated Biphenyls (PCB)

All PCB concentrations were below the laboratory LOR and the adopted health and ecological-based threshold limits.

9.2.7 Asbestos

One fibrous material fragment recovered from the lining of an old pipe onsite (ACM01) was tested for the presence of asbestos, with the laboratory results positively identifying the presence of Chrysotile and Amosite asbestos fibres.

9.3 Quality Assurance and Quality Control

The chosen analytical laboratory undertook internal QA/QC procedures, which include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery. Additional laboratory QA/QC procedures include sample receipt, logging, storage, preservation and analysis within the method specified holding time.

It was considered that the field and laboratory QA/QC criteria were generally within acceptable limits indicating field sampling, storage, handling and decontamination procedures and laboratory preparation and analysis procedures were adequate for the purposes of the environmental investigation. Therefore, the data set used as the basis for the soil assessment is considered valid and complete.

10 Conceptual Site Model

Generally, a Conceptual Site model (CSM) provides an assessment of the fate and transport of COPCs relative to site-specific subsurface conditions regarding their potential risk to human health and the environment. The CSM considers site-specific factors including:

- > Sources of potential contamination.
- > Identification of contaminants of potential concern (COPCs) associated with past and present sources.
- > Vertical, lateral, and temporal distribution of COPCs.
- > Site specific lithological information including soil type(s), depth to groundwater, effective porosity, and groundwater flow velocity.
- > Actual or potential receptors considering both current and future land use for both the site and adjacent properties, and any sensitive ecological receptors.

Considering the available information, a preliminary conceptual site model (PCSM) has been formulated for the future council lot site, with assumed land-use setting similar to residential application. Current and future exposure pathways for the overall site with respect to the future land use, are summarised in Table 10-1.

Table 10-1 Preliminary Conceptual Site Model

Conceptual Site Model Element	Description
Site History	▪ Formerly, undeveloped bushland.
Site Current and Future Use	▪ The site is presently vacant, with no formal application. The site area is used informally for recreational motorbike activities. ▪ It is understood that the future lot forming the site is to be dedicated to council, with site intended to become a community hub in the future. ▪ It is noted that parts or all of the future development may permit a less stringent assessment criteria, however a conservative assumption of future residential application has been conservatively considered herein.
Site Geology	▪ <i>Branxton Formation</i>: 'conglomerate, sandstone, and siltstone'. ▪ Intrusive investigation data indicates minimally disturbed areas generally comprise shallow topsoils and colluvium, overlying residual clays grading to weathered siltstone and sandstone. Heavily disturbed areas generally comprised weathered siltstone/sandstone at surface level, owing to probable former extractive / earthworks activities. ▪ Existing overburden fill materials were noted locally across the subject site, predominantly within the heavily disturbed areas. Some minor coal wash reject materials were also noted along parts of the western site boundary and emplaced on access tracks to the south-west.
Site Hydrogeology	▪ No groundwater was encountered in previous test pit excavations within the subject site area. ▪ Review of the groundwater wells installed as part of a previous groundwater investigation in the quarry site to the south and east (approx. 100 to 285m from the site), indicated groundwater depths ranging from approximately 8 to >37m below existing ground levels or at RL 57 to 32 m AHD. Subject site levels were estimated to range from approximately 63 to 72 m AHD, based on available LiDAR information. ▪ A shallow natural gully is noted to extend generally north-east offsite, close to the eastern site boundary. The gully was observed to be dry at the time of the site investigation works.
Area of Environmental Concern (AOEC) - Onsite	▪ Potential contamination associated with the existing uncontrolled fill materials onsite, predominantly comprising small stockpiles / mounds of overburden materials. The overburden materials mostly appeared to comprise natural residual clays and weathered siltstone/sand rock, with no visual or olfactory evidence of gross contamination observed within the materials. Limited testing of the typical overburden materials onsite has generally indicated chemical analyte concentrations generally below the adopted assessment criteria. ▪ Asbestos containing material positively identified at one isolated location (ACM01), within the lining material of an old discard pipe. ▪ Potential lateral migration of contaminants present within the adjacent colliery and quarry sites associated with historical industrial operations. Several possible sources of contamination are generally considered to be well-removed from the subject site or downgradient and considered unlikely to impact the subject site area. Additionally, Stantec has undertaken limited targeted sampling and testing of surface soils along or upgradient of the western boundary and within preferential overland flow paths to assess for lateral migration of any potential contaminants of concern. The results indicated all chemical analyte concentrations from samples collected onsite and offsite were below the adopted assessment criteria (following Silica Gel Cleanup for TRH detections).

Conceptual Site Model Element	Description
Media Potentially Impacted	▪ Potentially contaminated fill materials onsite. ▪ Potentially contaminated surficial soils onsite.
Potential Human Receptors	▪ Future onsite residents / workers. ▪ Site construction workers. ▪ Residents and future surrounding properties (offsite).
Potential Environmental Receptors	▪ Flora and fauna. ▪ On-site and surrounding soils. ▪ Nearby waterbodies, including existing downstream (offsite) dams / basins and natural drainage lines.
Potential Exposure Pathways	▪ Air: inhalation of dusts. ▪ Soil: dermal / direct contact. ▪ Lateral migration via surficial runoff.

Based on the findings of the desktop review, site inspection, and results of the laboratory analysis, the potential for gross contamination within the site area is generally considered low. It should be acknowledged that the nearby offsite colliery and quarry sites would be considered have a higher potential for contamination given the historical industrial applications. However, the current assessment has not indicated the presence of any gross onsite contamination, as a result from offsite sources/origins.

With respect to the previous site data and updated findings of the current desktop review and site inspection, the following data gaps have been identified:

- > Limited intrusive sampling spatially and vertically.
- > No groundwater samples collected; however, groundwater contamination is considered unlikely given the expected depth of groundwater.
- > No dangerous goods search was undertaken, however, unlikely to be present onsite.
- > No historical title deeds were ordered for the site, however, review of title deeds obtained in previous site assessments was undertaken.

11 Conclusions & Recommendations

Stantec have undertaken a Preliminary Site Investigation (PSI) of the land intended to form a future lot to be dedicated to council. The subject site occurs within part of Lot 696 DP1263808 and located at 1769 Wine Country Drive, North Rothbury. It is noted that the investigation was carried out to support a modification to the existing Huntlee New Town Stage 1 DA boundary ('MOD25') to include the future council lot site.

The investigation generally comprised a background review of the site history, site inspection, and limited subsurface soil sampling and laboratory analysis. The investigation was undertaken with reference to the relevant health and ecological based criteria for 'Residential A' land-use setting, as set out within the NEPM (2013) [1].

The subject site was historically undeveloped bushland from the earliest available site records (1961), with some evidence of disturbance occurring to the site by 1978. Site observations indicated that disturbance may have been related to possible former extractive activities, based on the appeared lowered ground levels. Historically, the site surrounds have comprised a mixture of undeveloped bushlands and numerous industrial operations associated with the former colliery site, including coal mining and washing, quarrying, landfilling, and later rail maintenance and restoration works.

Subsurface conditions across the site comprised shallow topsoils and colluvium overlying residual clays and weathered rock, within the minimally disturbed areas. The heavily disturbed areas predominantly comprised exposed sandstone and siltstone bedrock, with minor local uncontrolled fill materials consisting of small stockpiles / berms of natural overburden materials. Minor observations of CWR fragments were observed at the surface in proximity to the western site boundary, however no significant volumes of CWR were observed onsite. Some minor foreign materials including timber, rubber tyres, old pipework were noted in isolation, however at similarly low overall volumes. It is noted that the nearby colliery site comprises larger volumes of uncontrolled fill materials, consisting of natural overburden materials, CWR, and landfill waste.

Stantec acknowledge that the nearby colliery site to the west may comprise several areas with a higher potential for contamination based on the historical industrial operations. In addition to assessing onsite materials for contamination, Stantec carried out limited targeted sampling and testing, generally upgradient of the western site boundary and within a downgradient overland flow path onsite, to assess the potential for surface migration.

The results of the limited laboratory testing for a range of chemical analytes was undertaken on recovered soil samples, with all test samples reporting analyte concentrations either below the laboratory limit of reporting or below the adopted ecological and health-based assessment criteria, in accordance with the NEPM (2013) [1]. It is noted that several exceedances of the adopted ESLs and one exceedance of the HSL was initially reported within the C10-C16 and C16-C34 TRH fractions. However, subsequent silica gel cleanup (SGC) testing reduced all TRH concentrations to below the adopted ESLs/HSLs, generally indicating pre-SGC concentrations were largely due to the presence of naturally occurring hydrocarbons, rather than petroleum based.

Recovery and sampling of the lining to a discarded pipe onsite (ACM01) was also undertaken, with laboratory testing positively identifying the presence of asbestos fibres.

Based on the outcomes of this assessment, Stantec considers that the overall site area has a low potential for gross contamination. Acknowledging the generally minor and local areas of concern, Stantec recommend the following be undertaken:

- > Removal of any inert foreign materials / sundry items such as the observed disused tyres, timber, other general waste from the isolated areas of the site. The removal of foreign materials should be disposed at a licensed waste facility. Validation by visual confirmation of the removal of any foreign materials would be required.
- > Removal of the existing asbestos lined pipe ('ACM01') as Special Waste (Asbestos) in accordance with NSW EPA Waste Classification Guidelines, 2014 [22]. Validation of the underlying soils / embedded overburden fill materials would require validation following the pipe removal. It is noted that the existing pipe was relatively intact during inspection and sampling, as such, it is considered that validation could be confirmed by visual inspection following pipe removal.
- > Any natural in-situ soils and site filling intended to be excavated and transported off site for disposal would require classification in accordance with the NSW EPA guidelines [22]. Alternatively, natural in-situ soils and filling comprising overburden natural soils/rock could be considered for offsite reuse following specific

assessment in accordance with NSW EPA The Excavated Natural Material Order, 2014 [23], or classified as Virgin Excavated Natural Material (VENM) if applicable.

- > Where site soils are to be retained onsite, further assessment of geotechnical suitability for reuse should be conducted. It is noted that Stantec are currently undertaking preliminary geotechnical assessment for the site, concurrent to this investigation, to be reported under a separate cover (ref. 304001022-114.1, dated. 03/07/2025).
- > As the subject site area is generally considered a generally low risk for gross contamination, with only minor local issues identified, it is recommended that an unexpected finds protocol (UFP) be developed for the site and implemented during future development construction.
- > The development and implementation of an unexpected finds protocol (UFP) to address any potential issues that may be uncovered during the development.

Given the nature of the proposed recommendations and probable integration with future earthworks / civil construction activities, it is generally considered that the above recommendations could be implemented at the commencement of construction, following approvals to the proposed DA modification.

Based on the findings of this investigation, Stantec did not identify any gross contamination or potentially contaminating activities which would render the site unsuitable for the proposed future use. On the basis the provided recommendations to address minor areas of the site are implemented, Stantec consider the site would be rendered suitable for the proposed future use, in accordance with the *State Environmental Planning Policy (Resilience and Hazards) 2021* [24].

12 Standard of Assessment and Limitations

This investigation has been undertaken in general accordance with the current “industry standards” for a site investigation for the purpose, objectives and scope identified in this report. These standards are set out in:

- > National Environment Protection Council (NEPC) (1999) *National Environment Protection (Assessment of Site Contamination) Measure*, as amended (registered on 15 May 2013) [1]. This is referred to from here on as “the NEPM” or “NEPM”.
- > Standards Australia (2005) *AS4482.1- 2005: Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds* [25].
- > NSW EPA “*Guidelines for Consultants Reporting on Contaminated Sites*” [2].

The agreed scope of this investigation has been limited for the current purposes of the client. The investigation may not identify contamination occurring in all areas of the site, or occurring after sampling was conducted. Subsurface conditions may vary considerably away from the sample locations where information has been obtained.

This site investigation report is not any of the following:

- > An Environmental Audit Report as defined under NSW Site Auditor Scheme [26].
- > A detailed site investigation (DSI) report sufficient for an Environmental Auditor to be able to conclude a statutory or non-statutory environmental audit.
- > A geotechnical report, and the logs may not be sufficient as the basis for geotechnical advice.
- > A detailed hydrogeological assessment or an assessment of groundwater contaminants potentially arising from other sites or sources nearby.
- > A waste classification report of soil analytical results from the site.

13 References

- [1] National Environment Protection Council, "National Environment Protection (Assessment of Site Contamination) Measure," Australian Government, 15 May 2013.
- [2] NSW Environment Protection Authority, "Consultants reporting on contaminated land guidelines - Contaminated Land Guidelines," NSW Government, 2020.
- [3] Department of Urban Affairs and Planning, "Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land," NSW Government, 1998.
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- [8] Environmental Resources Management Australia, "Environmental Audit and Phase 1 Contamination Assessment – Ayrfield Colliery, NSW," September 2003.
- [9] Douglas Partners, "Report on Preliminary Geotechnical Assessment, Hunter Valley Project, North Rothbury," September 2003.
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- [18] Department of Planning, Industry and Environment, "Soil and Land Resources of Central and Eastern NSW, Version 3," NSW Office of Environment and Heritage, Sydney, 2018.
- [19] Hawley S.P., Glen R.A. and Baker C.J., Newcastle Coalfield Regional Geology 1:100,000, Sydney: Geological Survey of New South Wales, 1995.
- [20] Lau J.E., Jacobson G., Hydrogeology of Australian 1:5 000 000, Bureau of Mineral Resources, Geology and Geophysics, Department of Resources and Energy, 1987.
- [21] NSW Department of Planning and Environment, "Acid Sulfate Soils Risk - SEED Map," NSW Government, [Online]. Available: <https://datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c>.
- [22] NSW Environment Protection Authority, "Waste Classification Guidelines, Part 1: Classifying Waste," NSW Government, 2014.
- [23] NSW Environment Protection Authority, "The excavated natural material order," NSW Government, 2014.
- [24] NSW Government, Stage of Environmental Planning Policy (Resilience and Hazards), 2021.
- [25] Standards Australia, "Australian Standard - Guide to the investigation and sampling of sites with potentially contaminated soils - Part one: Non-volatile and semi-volatile compounds," Standards Australia, 2005.
- [26] NSW DEC, "Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd Edition)," Department of Environment and Conservation NSW, 2017.

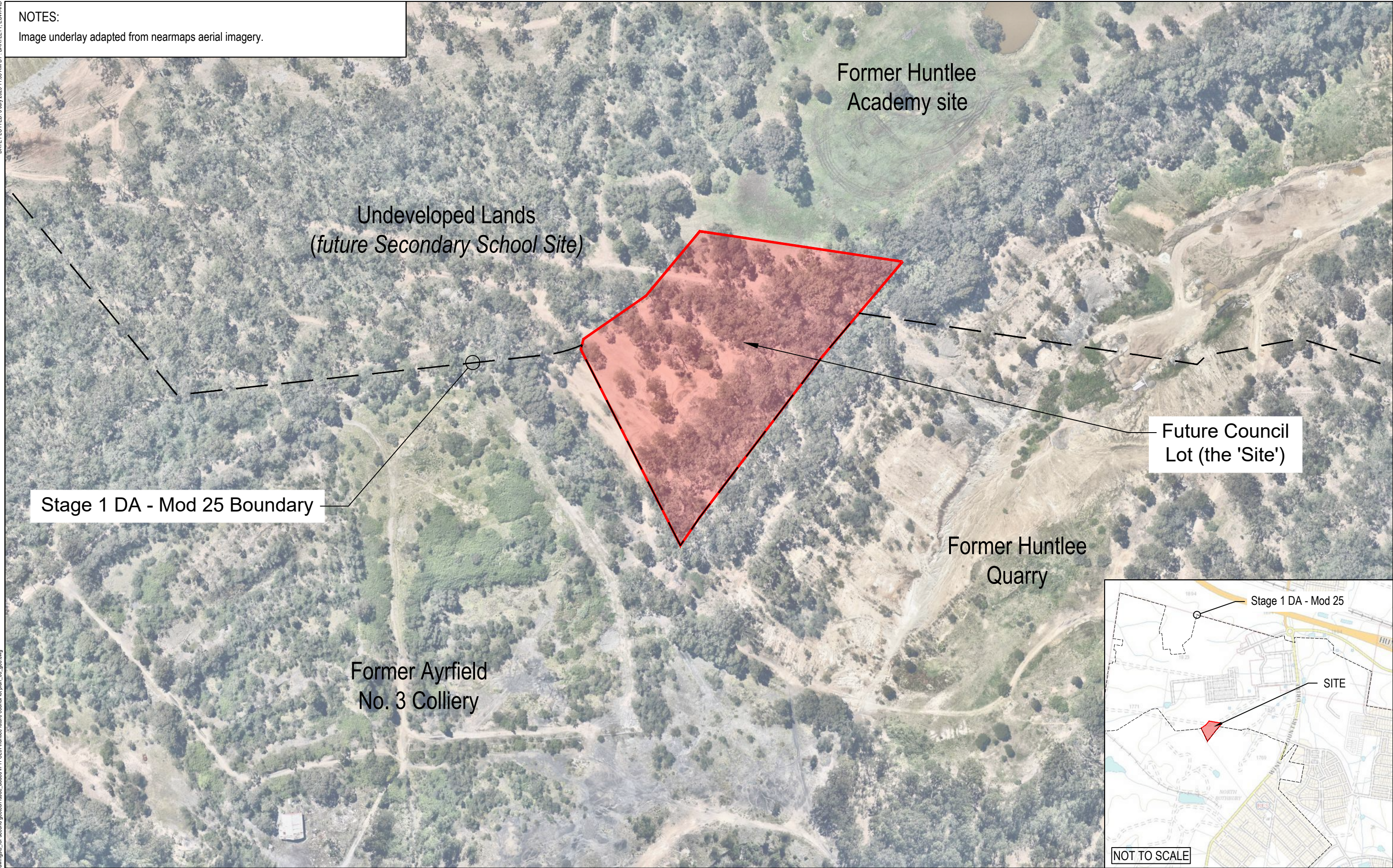
APPENDIX

A

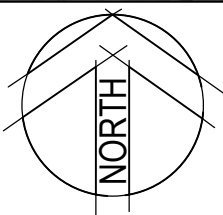
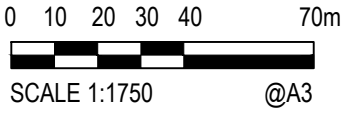
DRAWINGS

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NOTES:
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Drawn	TB	Date	11.11.2024
Checked	TB	Date	11.11.2024
Revised	TB	Date	11.05.2025
Verified		Date	
Approved			

Client	HUNTLEE PTY LTD
Project	HUNTLEE NEW TOWN STAGE 1 DA - MOD 25 FUTURE COUNCIL LOT SITE NORTH ROTHBURY
Title	SITE LOCALITY PLAN

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Drawing Number	D1	Size	A3
		Revision	B

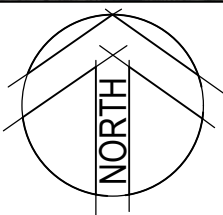
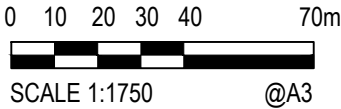
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NOTES:

Image underlay adapted from nearmaps aerial imagery.

Topographic contours developed from available LiDAR survey data



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Revised	TB	Date	11.05.2025
Verified		Date	
Approved			

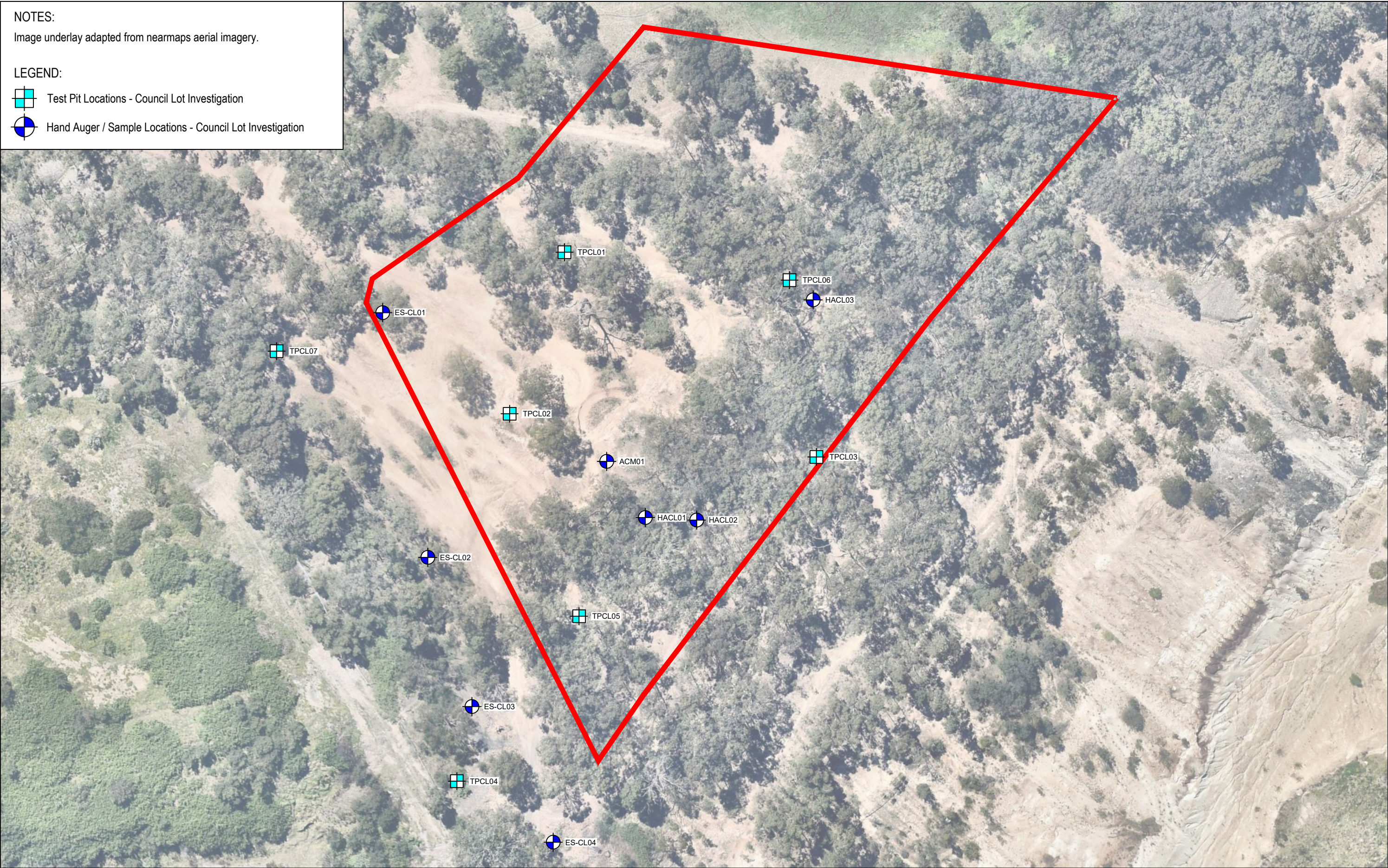
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Project	HUNTEE NEW TOWN STAGE 1 DA - MOD 25 FUTURE COUNCIL LOT SITE NORTH ROTHBURY
Title	SITE TOPOGRAPHY & DRAINAGE

Status	FOR INFORMATION ONLY NOT TO BE USED FOR CONSTRUCTION PURPOSES		
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Drawing Number	D2	Size	A3
		Revision	B

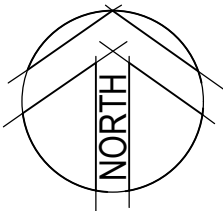
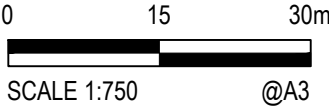
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NOTES:
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- LEGEND:
- Test Pit Locations - Council Lot Investigation
 - Hand Auger / Sample Locations - Council Lot Investigation



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Checked	TB	Date	11.11.2024
Revised	TB	Date	11.05.2025
Verified		Date	
Approved			

Client HUNTLEE PTY LTD

Project HUNTLEE NEW TOWN STAGE 1 DA - MOD 25
FUTURE COUNCIL LOT SITE
NORTH ROTHBURY

Title INTRUSIVE TEST LOCATIONS

Status **FOR INFORMATION ONLY**
NOT TO BE USED FOR CONSTRUCTION PURPOSES

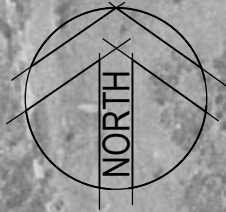
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D3	B	

APPENDIX

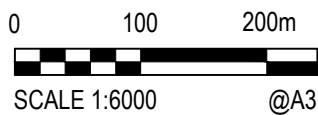
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HISTORICAL AERIALS

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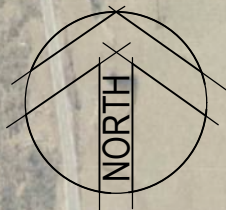


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1976



1978

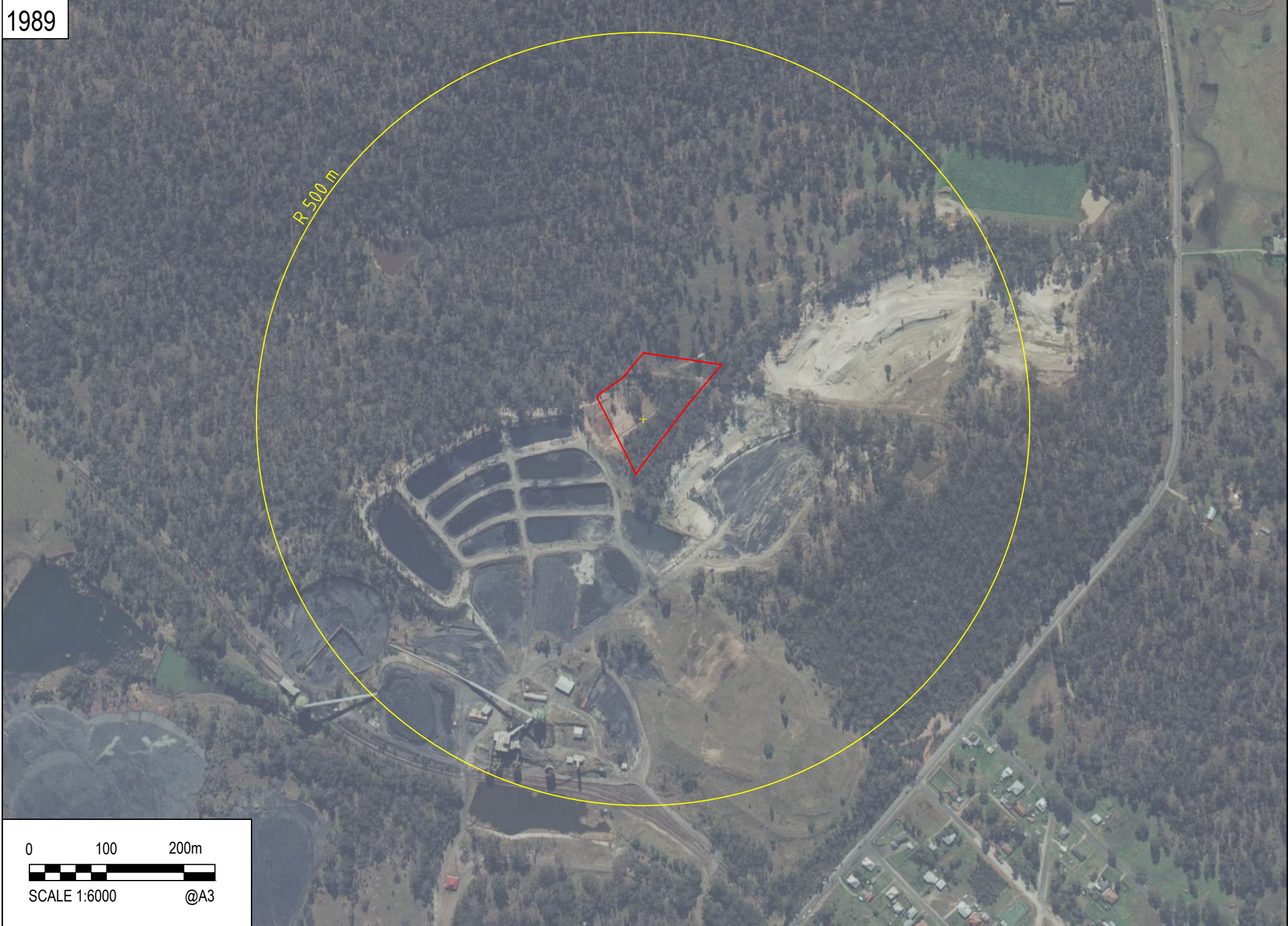


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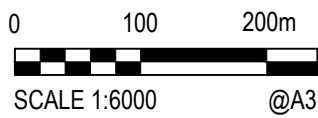
1989



1990



1994



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1998



2004



2006



2007



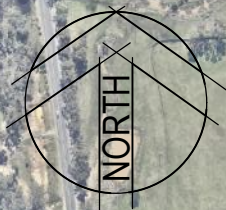
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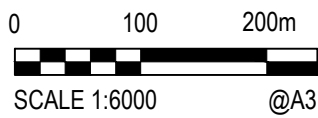
2010



2015



2020



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2023



2025



APPENDIX

C

ENGINEERING LOGS

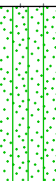
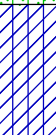
Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW
Job No: 304001022-115
Sheet: 1 of 1

Position: Refer to site plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 30 tonne excavator
Excavation Method: 1.5m toothed bucket

Excavation Dimensions:
Contractor: KCE

Date Excavated: 23/5/24
Logged By: TB / BC
Checked By:

Excavation			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Stability		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
↑ EX ↓		Stable	Not Observed	ES 0.10 m (jar)	0.00			TOPSOIL: Silty SAND, fine grained, dark brown, trace fine gravel, some rootlets	M		TOPSOIL 0.00 m: test pit excavated in existing cut face
					0.30m			Silty SAND, fine grained, brown, trace fine gravel	D		COLLUVIUM
					0.70m			Silty CLAY, medium to high plasticity, red-brown, some tree roots	M (≈PL)		RESIDUAL SOIL
					1.00m			SILTSTONE/SANDSTONE, pale grey-white, orange and red, extremely to highly weathered			WEATHERED ROCK 1.70 m: tree roots to 1.7m
					2.5			TERMINATED AT 2.60 m Target depth			

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Client:	Huntlee Pty Ltd	Job No:	304001022-115	Sheet:	1 of 1
Project:	Huntlee Future Council Lot - Preliminary Site Investigation				
Location:	North Rothbury NSW				
Position:	Refer to site plan	Angle from Horizontal:	90°	Surface Elevation:	
Machine Type:	30 tonne excavator	Excavation Method:	1.5m toothed bucket		
Excavation Dimensions:		Contractor:	KCE		
Date Excavated:	23/5/24	Logged By:	TB / BC	Checked By:	

Excavation			Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX		Minor spalling	Not Observed	ES 0.10 m (jar)				FILL: Clayey SAND, fine to medium grained, grey to brown, with fine to coarse gravel and cobbles, some rootlets	D		FILL 0.00 m: Test pit excavated in existing fill berm / motor bike jump. Minor chitter fragments observed at surface.
					0.5						
					1.0						
					1.5		1.50m				
				B 1.80 - 2.10 m				CLAY, medium to high plasticity, pale grey-white and orange, with silt	M (<PL)	VSt - H	RESIDUAL SOIL
					2.0		2.10m				
				RI 20/125mm				SILTSTONE/SANDSTONE, pale grey-white, orange and red, highly weathered			WEATHERED ROCK
					2.5						
					3.0		3.00m				
					3.5			TERMINATED AT 3.00 m Target depth			

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW
Job No: 304001022-115
Sheet: 1 of 1

Position: Refer to site plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 30 tonne excavator
Excavation Method: 1.5m toothed bucket

Excavation Dimensions:
Contractor: KCE

Date Excavated: 23/5/24
Logged By: TB / BC
Checked By:

Excavation			Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Stability	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density
↑		Stable	Not Observed	ES 0.00 - 0.10 m (jar + zip)	3 6 9 12		0.10m	TOPSOIL: Silty SAND, fine grained, dark brown, trace fine gravel, some rootlets	D	TOPSOIL
				ES 0.15 - 0.25 m (jar + zip)	2			Silty SAND, fine to medium grained, black, with fine to medium gravel, some roots / rootlets		ALLUVIUM / COLLUVIUM
					6		0.70m	Silty CLAY, low plasticity to medium plasticity, pale grey-white and orange, trace fine to medium grained sand	M	MD
					5					
					15					
↓		Stable	Not Observed		20		1.30m	SILTSTONE/SANDSTONE, pale grey-white, orange and red, highly weathered	M (<PL)	VSt - H
					17					RESIDUAL SOIL
					12					
					16					
					23		1.80m	TERMINATED AT 1.80 m Slow Progress		WEATHERED ROCK

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW

Job No: 304001022-115

Sheet: 1 of 1

Position: Refer to site plan

Angle from Horizontal: 90°

Surface Elevation:

Machine Type: 30 tonne excavator

Excavation Method: 1.5m toothed bucket

Excavation Dimensions:

Contractor: KCE

Date Excavated: 23/5/24

Logged By: TB / BC

Checked By:

Excavation			Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX			Not Observed					FILL: Sandy Gravelly CLAY, low to medium plasticity, some rootlets	D		FILL 0.00 m: excavated from top of existing cell embankment
								FILL: Clayey Sandy GRAVEL, fine to coarse, angular, black, with silt (coal wash reject)	D		
				ES 0.90 - 1.00 m (jar)	1						1.60 m: some foreign inclusions: plastic, rubber
											3.00 m: some foreign inclusions: timber
											3.90 m: possible drainage layer
											RESIDUAL SOIL
											TERMINATED AT 5.00 m Slow Progress

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller			PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow			FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)			SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content			SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense		
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW
Job No: 304001022-115
Sheet: 1 of 1

Position: Refer to site plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 30 tonne excavator
Excavation Method: 1.5m toothed bucket

Excavation Dimensions:
Contractor: KCE

Date Excavated: 23/5/24
Logged By: TB / BC
Checked By:

Excavation			Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Stability	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density
EX		Stable	Not Observed	ES 0.10 m (zip)	0.15m		0.15m	TOPSOIL: Silty SAND, fine grained, dark brown, trace fine gravel, some rootlets	D	TOPSOIL
					0.30m		0.30m	Silty SAND, fine to medium grained, grey, with clay	D	COLLUVIUM
				ES 0.40 - 0.50 m (zip)	0.5m		0.5m	Silty CLAY, medium to high plasticity, mottled red-brown and grey, with fine grained sand	M (≅PL)	RESIDUAL SOIL
				U50 0.40 - 0.70 m	0.80m		0.80m	Silty SANDY CLAY, low to medium plasticity, pale grey-white and orange (extremely weathered siltstone/sandstone)	M (<PL)	EXTREMELY WEATHERED
					1.0m		1.0m	SILTSTONE/SANDSTONE, pale grey-white, orange and red, highly weathered		WEATHERED ROCK
					1.70 m			1.70 m: increasing bucket resistance		
					2.00m		2.00m	TERMINATED AT 2.00 m Target depth		

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW
Job No: 304001022-115
Sheet: 1 of 1

Position: Refer to site plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 30 tonne excavator
Excavation Method: 1.5m toothed bucket

Excavation Dimensions:
Contractor: KCE

Date Excavated: 23/5/24
Logged By: TB / BC
Checked By:

Excavation			Sampling & Testing		Depth (m)	Material Description					
Method	Resistance	Stability	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX		Stable	Not Observed	ES 0.80 m (zip)	0.00			FILL: Silty SAND, fine to medium grained, pale brown and grey, trace gravel, some clay zones, some rootlets (topsoil / overburden blend)	D		FILL
					0.40						
					0.60			FILL: Silty CLAY, low plasticity, brown and grey, trace gravel and cobbles (overburden material)	D		
					0.95			Silty CLAY, low to medium plasticity, red-brown, with fine grained sand	M (<PL)	VSt	RESIDUAL SOIL
					1.20			Silty Sandy CLAY, low plasticity, pale grey-white and orange (extremely weathered siltstone/sandstone)	M (<PL)	VSt - H	EXTREMELY WEATHERED
					1.50			SILTSTONE/SANDSTONE, pale grey-white, orange and red, highly weathered			WEATHERED ROCK
					2.00			TERMINATED AT 2.00 m Target depth			

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW

Job No: 304001022-115

Sheet: 1 of 1

Position: Refer to site plan
Angle from Horizontal: 90°
Surface Elevation:

Machine Type: 30 tonne excavator
Excavation Method: 1.5m toothed bucket

Excavation Dimensions:
Contractor: KCE

Date Excavated: 23/5/24
Logged By: TB / BC
Checked By:

Excavation			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Stability		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
EX		Stable	Not Observed	B 0.40 - 0.80 m	0.5		SILTSTONE/SANDSTONE, pale grey-white, orange and red, extremely to highly weathered			WEATHERED ROCK	
							TERMINATED AT 0.80 m Slow Progress				

METHOD

EX Excavator bucket
 R Ripper
 HA Hand auger
 PT Push tube
 SON Sonic drilling
 AH Air hammer
 PS Percussion sampler
 AS Short spiral auger
 AD/V Solid flight auger: V-Bit
 AD/T Solid flight auger: TC-Bit
 HFA Hollow flight auger
 WB Washbore drilling
 RR Rock roller

PENETRATION

VE Very Easy (No Resistance)
 E Easy
 F Firm
 H Hard
 VH Very Hard (Refusal)

WATER

Water Level on Date shown
 water inflow
 water outflow

FIELD TESTS

SPT - Standard Penetration Test
 HP - Hand/Pocket Penetrometer
 DCP - Dynamic Cone Penetrometer
 PSP - Perth Sand Penetrometer
 MC - Moisture Content
 PBT - Plate Bearing Test
 IMP - Borehole Impression Test
 PID - Photoionisation Detector
 VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)

SAMPLES

B - Bulk disturbed sample
 D - Disturbed sample
 ES - Environmental sample
 U - Thin wall tube 'undisturbed'

MOISTURE

D - Dry
 M - Moist
 W - Wet
 PL - Plastic limit
 LL - Liquid limit
 w - Moisture content

SOIL CONSISTENCY

VS - Very Soft
 S - Soft
 F - Firm
 St - Stiff
 VSt - Very Stiff
 H - Hard

RELATIVE DENSITY

VL - Very Loose
 L - Loose
 MD - Medium Dense
 D - Dense
 VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

Client:	Huntlee Pty Ltd
Project:	Huntlee Future Council Lot - Preliminary Site Investigation
Location:	North Rothbury NSW

Hole No: HACL01

Job No: 304001022-115

Sheet: 1 of 1

Position: Refer to site plan

Angle from Horizontal: 90°

Surface Elevation:

Equipment: Hand Tools

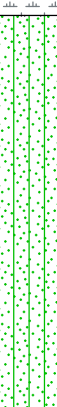
Contractor:

Casing Diameter:

Logged By: TB / BC

Checked By:

Date Started: 23/5/24

Drilling			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Casing		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
HAND TOOLS			Not Observed	ES 0.10 m (zip)			TOPSOIL: Silty SAND, fine grained, dark brown, trace fine gravel, abundant rootlets	M		TOPSOIL 0.00 m: excavated within natural drainage line / lower lying area	
						0.10m	Silty SAND, fine to medium grained, black, with fine to medium gravel, some roots / rootlets	M		ALLUVIUM / COLLUVIUM	
						0.40m	TERMINATED AT 0.40 m Target depth				
					0.5						

METHOD	PENETRATION	FIELD TESTS	SAMPLES	SOIL CONSISTENCY
EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal)	SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed'	VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard
	WATER  Water Level on Date shown  water inflow  water outflow		MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions.

STANTEC AUSTRALIA PTY LTD

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW

Job No: 304001022-115

Sheet: 1 of 1

Position: Refer to site plan
Angle from Horizontal: 90°
Surface Elevation:

Equipment: Hand Tools

Casing Diameter:

Contractor:

Date Started: 23/5/24

Logged By: TB / BC

Checked By:

Drilling			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Casing		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
HAND TOOLS			Not Observed	ES 0.05 m (jar)			0.10m	TOPSOIL: Silty Clayey SAND, fine grained, dark brown, abundant rootlets	M		TOPSOIL 0.00 m: excavated within natural drainage line / lower lying area
								TERMINATED AT 0.10 m Target depth			

METHOD

EX Excavator bucket
 R Ripper
 HA Hand auger
 PT Push tube
 SON Sonic drilling
 AH Air hammer
 PS Percussion sampler
 AS Short spiral auger
 AD/V Solid flight auger: V-Bit
 AD/T Solid flight auger: TC-Bit
 HFA Hollow flight auger
 WB Washbore drilling
 RR Rock roller

PENETRATION

VE Very Easy (No Resistance)
 E Easy
 F Firm
 H Hard
 VH Very Hard (Refusal)

WATER

Water Level on Date shown
 water inflow
 water outflow

FIELD TESTS

SPT - Standard Penetration Test
 HP - Hand/Pocket Penetrometer
 DCP - Dynamic Cone Penetrometer
 PSP - Perth Sand Penetrometer
 MC - Moisture Content
 PBT - Plate Bearing Test
 IMP - Borehole Impression Test
 PID - Photoionisation Detector
 VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)

SAMPLES

B - Bulk disturbed sample
 D - Disturbed sample
 ES - Environmental sample
 U - Thin wall tube 'undisturbed'

MOISTURE

D - Dry
 M - Moist
 W - Wet
 PL - Plastic limit
 LL - Liquid limit
 w - Moisture content

SOIL CONSISTENCY

VS - Very Soft
 S - Soft
 F - Firm
 St - Stiff
 VSt - Very Stiff
 H - Hard

RELATIVE DENSITY

VL - Very Loose
 L - Loose
 MD - Medium Dense
 D - Dense
 VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions

STANTEC AUSTRALIA PTY LTD

Hole No: HACL03

Client: Huntlee Pty Ltd
 Project: Huntlee Future Council Lot - Preliminary Site Investigation
 Location: North Rothbury NSW Job No: 304001022-115

Position: Refer to site plan	Angle from Horizontal: 90°	Surface Elevation:
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Equipment: Hand Tools	
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Casing Diameter:	Contractor:
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Date Started: 23/5/24 Logged By: TB / BC Checked By:

Drilling			Water	Sampling & Testing	Depth (m)	Material Description					
Method	Resistance	Casing		Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
↑ HAND TOOLS ↓			Not Observed	ES 0.10 m (jar)				Gravelly SAND, fine to coarse grained, pale brown and red, fine to coarse gravel (derived conglomerate bedrock upslope)	D - M		SLOPE WASH 0.00 m: excavated within preferential overland flow path, receiving flows from upslope quarried area
					0.5			0.20m TERMINATED AT 0.20 m Target depth			

METHOD	PENETRATION	FIELD TESTS	SAMPLES	SOIL CONSISTENCY
EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal)	SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed'	VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard
	WATER  Water Level on Date shown  water inflow  water outflow		MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense

Refer to explanatory notes for details of abbreviations and basis of descriptions.

STANTEC AUSTRALIA PTY LTD

Client: Huntlee Pty Ltd Project: Huntlee Future Council Lot - Preliminary Site Investigation Location: North Rothbury NSW				Hole No: ES-CL01 Job No: 304001022-115 Sheet: 1 of 1			
Position: Refer to site plan Machine Type: Hand Tools				Angle from Horizontal: 90°		Surface Elevation:	
Casing Diameter:				Contractor:			
Date Started: 29/10/24				Logged By: TB		Checked By:	

Drilling			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Casing		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
			Not Observed	ES 0.05 - 0.10 m			FILL: Clayey Gravelly SAND, fine to coarse grained, brown, fine to coarse gravel (overburden materials)			FILL	
						0.10m	TERMINATED AT 0.10 m Target depth				
						0.5					

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER Water Level on Date shown water inflow water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW Job No:

Hole No: ES-CL02

Job No: 304001022-115

Sheet: 1 of 1

Position: Refer to site plan

Angle from Horizontal: 90°

Surface Elevation:

Machine Type: Hand Tools

Contractor:

Casing Diameter:

Logged By: TB

Checked By:

Date Started: 29/10/24

Drilling Log - 12										Checked By:	
Drilling			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Casing		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
			Not Observed				TOPSOIL: Silty SAND, fine to medium grained, dark brown, abundant rootlets 0.05m: colour change to grey brown, reduced organic inclusions			TOPSOIL	
				ES 0.05 - 0.10 m		0.10m	TERMINATED AT 0.10 m Target depth				

METHOD	PENETRATION	FIELD TESTS	SAMPLES	SOIL CONSISTENCY
EX Excavator bucket	VE Very Easy (No Resistance)	SPT - Standard Penetration Test	B - Bulk disturbed sample	VS - Very Soft
R Ripper	E Easy	HP - Hand/Pocket Penetrometer	D - Disturbed sample	S - Soft
HA Hand auger	F Firm	DCP - Dynamic Cone Penetrometer	ES - Environmental sample	F - Firm
PT Push tube	H Hard	PSP - Perth Sand Penetrometer	U - Thin wall tube 'undisturbed'	St - Stiff
SON Sonic drilling	VH Very Hard (Refusal)	MC - Moisture Content		VSt - Very Stiff
AH Air hammer		PBT - Plate Bearing Test		H - Hard
PS Percussion sampler		IMP - Borehole Impression Test		
AS Short spiral auger		PID - Photoionisation Detector		
AD/V Solid flight auger: V-Bit		VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)		
AD/T Solid flight auger: TC-Bit				
HFA Hollow flight auger				
WB Washbore drilling				
RR Rock roller				
	WATER		MOISTURE	RELATIVE DENSITY
	 Water Level on Date shown		D - Dry	VL - Very Loose
	 water inflow		M - Moist	L - Loose
	 water outflow		W - Wet	MD - Medium Dense
			PL - Plastic limit	D - Dense
			LL - Liquid limit	VD - Very Dense
			w - Moisture content	

Refer to explanatory notes for details of abbreviations and basis of descriptions.

STANTEC AUSTRALIA PTY LTD

ENVIRONMENTAL TEST PIT LOG SHEET

Client: Huntlee Pty Ltd
Project: Huntlee Future Council Lot - Preliminary Site Investigation
Location: North Rothbury NSW Job No:

Hole No: ES-CL03

Job No: 304001022-115

Sheet: 1 of 1

Position: Refer to site plan

Angle from Horizontal: 90°

Surface Elevation:

Machine Type: Hand Tools

Contractor:

Casing Diameter:

Logged By: TB

Checked By:

Date Started: 29/10/24

Drilling			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Casing		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
			Not Observed	ES 0.05 - 0.10 m			FILL: Silty SAND, fine to medium grained, black to dark grey, minor rootlets (coal wash reject material)			FILL	
						0.10m	TERMINATED AT 0.10 m Target depth				
					0.5						

METHOD	PENETRATION	FIELD TESTS	SAMPLES	SOIL CONSISTENCY
EX Excavator bucket	VE Very Easy (No Resistance)	SPT - Standard Penetration Test	B - Bulk disturbed sample	VS - Very Soft
R Ripper	E Easy	HP - Hand/Pocket Penetrometer	D - Disturbed sample	S - Soft
HA Hand auger	F Firm	DCP - Dynamic Cone Penetrometer	ES - Environmental sample	F - Firm
PT Push tube	H Hard	PSP - Perth Sand Penetrometer	U - Thin wall tube 'undisturbed'	St - Stiff
SON Sonic drilling	VH Very Hard (Refusal)	MC - Moisture Content		VSt - Very Stiff
AH Air hammer		PBT - Plate Bearing Test		H - Hard
PS Percussion sampler		IMP - Borehole Impression Test		
AS Short spiral auger		PID - Photoionisation Detector		
AD/V Solid flight auger: V-Bit		VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)		
AD/T Solid flight auger: TC-Bit				
HFA Hollow flight auger				
WB Washbore drilling				
RR Rock roller				
	WATER		MOISTURE	RELATIVE DENSITY
	 Water Level on Date shown		D - Dry	VL - Very Loose
	 water inflow		M - Moist	L - Loose
	 water outflow		W - Wet	MD - Medium Dense
			PL - Plastic limit	D - Dense
			LL - Liquid limit	VD - Very Dense
			w - Moisture content	

Refer to explanatory notes for details of abbreviations and basis of descriptions.

STANTEC AUSTRALIA PTY LTD

Client: Huntlee Pty Ltd Project: Huntlee Future Council Lot - Preliminary Site Investigation Location: North Rothbury NSW				Job No: 304001022-115 Sheet: 1 of 1				Hole No: ES-CL04			
Position: Refer to site plan				Angle from Horizontal: 90°				Surface Elevation:			
Machine Type: Hand Tools										Contractor:	
Casing Diameter:										Checked By:	
Date Started: 29/10/24										Logged By: TB	

Drilling			Water	Sampling & Testing		Depth (m)	Material Description				
Method	Resistance	Casing		Sample or Field Test	Graphic Log		Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
			Not Observed	ES 0.05 - 0.10 m			FILL: Silty SAND, fine to coarse grained, brown, with gravel, some organics (stockpile of predominantly topsoils/colluvium)			FILL	
						0.10m	TERMINATED AT 0.10 m Target depth				
						0.5					

METHOD EX Excavator bucket R Ripper HA Hand auger PT Push tube SON Sonic drilling AH Air hammer PS Percussion sampler AS Short spiral auger AD/V Solid flight auger: V-Bit AD/T Solid flight auger: TC-Bit HFA Hollow flight auger WB Washbore drilling RR Rock roller	PENETRATION VE Very Easy (No Resistance) E Easy F Firm H Hard VH Very Hard (Refusal) WATER  Water Level on Date shown  water inflow  water outflow	FIELD TESTS SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer DCP - Dynamic Cone Penetrometer PSP - Perth Sand Penetrometer MC - Moisture Content PBT - Plate Bearing Test IMP - Borehole Impression Test PID - Photoionisation Detector VS - Vane Shear; P=Peak, R=Residual (uncorrected kPa)	SAMPLES B - Bulk disturbed sample D - Disturbed sample ES - Environmental sample U - Thin wall tube 'undisturbed' MOISTURE D - Dry M - Moist W - Wet PL - Plastic limit LL - Liquid limit w - Moisture content	SOIL CONSISTENCY VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense
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Refer to explanatory notes for details of abbreviations and basis of descriptions

STANTEC AUSTRALIA PTY LTD

APPENDIX

D

LABORATORY TEST RESULTS

CHAIN OF CUSTODY RECORD



Laboratory:	Envirolab	Client:	Stantec Australia Pty Ltd
Address:	12 Ashley St Chatswood, NSW 2067	Address:	Suite 2, Level 2, 22 Honeysuckle Drive Newcastle, NSW 2300
Contact:	Ted Bartlett	Results to:	edward.bartlett@stantec.com
Ph:	0401 611 435	Invoice to:	brock.collinson@cardno.com.au
Email:	edward.bartlett@stantec.com	Invoice to:	sapinvoices@stantec.com
Project:	Huntlee Future Council Lot	Date Results Required:	Standard TAT
Project Ref:	304001022-115		
Sampled by:	Brock Collinson		

All samples chilled and/or frozen immediately following sampling.
Please retain all samples for further SCr and contamination testing.

Lab ID	Client Sample ID	Date Sampled	Matrix	Containers / Preservation					Contamination Suite	Asbestos ID	
			Soil	Soil Jar	Zip Lock				TRH, BTEX, PAH, OCP, OPP, 8 Metals	#N/A	#N/A
	TPCL01 0-0.1m	23-05-24	x	x					CS005_B	#N/A	#N/A
	TPCL02 0-0.1m	23-05-24	x	x							
	TPCL03 0-0.1m	23-05-24	x	x							
	TPCL03 0-0.1m	23-05-24	x		x						
	TPCL03 0.15-0.2m	23-05-24	x	x							
	TPCL03 0.15-0.2m	23-05-24	x		x						
	TPCL04 0.9-1m	23-05-24	x	x							
8	TPCL04 2.8-2.9m	23-05-24	x	x					x		
	TPCL04 3.5m	23-05-24	x	x							
	TPCL04 4.2m	23-05-24	x	x							
	TPCL04 4.2m	23-05-24	x		x						
	TPCL05 0.4-0.5	23-05-24	x		x						
	TPCL06 0.8m	23-05-24	x		x						
	HACL01 0.1m	23-05-24	x		x						
15	HACL02 0.05m	23-05-24	x	x					x		
16	HACL03 0-0.1m	23-05-24	x	x					x		
17	ACM01	23-05-24	Fragment		x					x	

Relinquished by Ted Bartlett Signature Date/Time 14-06-24

Received by A-B-1 Signature Date/Time 14/6/24 1506

352434-8

CERTIFICATE OF ANALYSIS 352434-B

Client Details

Client	Stantec Newcastle
Attention	Brock Collinson
Address	Suite 2, Level 2, 22 Honeysuckle Drive, NEWCASTLE, NSW, 2300

Sample Details

Your Reference	<u>304001022-115 Huntlee Future Council Lot</u>
Number of Samples	Additional analysis
Date samples received	28/05/2024
Date completed instructions received	14/06/2024

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.

Report Details

Date results requested by	21/06/2024
Date of Issue	21/06/2024
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Asbestos Approved By

Analysed by Asbestos Approved Analyst: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Stuart Chen

Results Approved By

Dragana Tomas, Senior Chemist
 Giovanni Agosti, Group Technical Manager
 Liam Timmins, Organics Supervisor
 Stuart Chen, Asbestos Approved Identifier/Report coordinator
 Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	17/06/2024	17/06/2024	17/06/2024
Date analysed	-	19/06/2024	19/06/2024	19/06/2024
TRH C ₆ - C ₉	mg/kg	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	85	93

svTRH (C10-C40) in Soil				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	17/06/2024	17/06/2024	17/06/2024
Date analysed	-	19/06/2024	19/06/2024	19/06/2024
TRH C ₁₀ - C ₁₄	mg/kg	87	57	<50
TRH C ₁₅ - C ₂₈	mg/kg	460	250	<100
TRH C ₂₉ - C ₃₆	mg/kg	210	220	<100
Total +ve TRH (C10-C36)	mg/kg	760	530	<50
TRH >C ₁₀ -C ₁₆	mg/kg	110	64	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	110	64	<50
TRH >C ₁₆ -C ₃₄	mg/kg	580	400	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	170	<100
Total +ve TRH (>C10-C40)	mg/kg	700	640	<50
Surrogate o-Terphenyl	%	107	91	83

PAHs in Soil				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	17/06/2024	17/06/2024	17/06/2024
Date analysed	-	19/06/2024	19/06/2024	19/06/2024
Naphthalene	mg/kg	0.8	<0.1	0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.3	0.2	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	1.2	0.4	0.1
Pyrene	mg/kg	0.6	0.2	0.1
Benzo(a)anthracene	mg/kg	0.3	0.2	<0.1
Chrysene	mg/kg	0.5	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.5	0.2	<0.2
Benzo(a)pyrene	mg/kg	0.06	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	5.4	1.5	0.51
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	88	86	88

Organochlorine Pesticides in soil				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	17/06/2024	17/06/2024	17/06/2024
Date analysed	-	19/06/2024	19/06/2024	19/06/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<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	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	116	114	111

Organophosphorus Pesticides in Soil				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	17/06/2024	17/06/2024	17/06/2024
Date analysed	-	19/06/2024	19/06/2024	19/06/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Parathion-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
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	116	114	111

Acid Extractable metals in soil				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	18/06/2024	18/06/2024	18/06/2024
Date analysed	-	19/06/2024	19/06/2024	19/06/2024
Arsenic	mg/kg	<4	6	11
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	8	10	13
Copper	mg/kg	28	8	7
Lead	mg/kg	10	14	6
Mercury	mg/kg	0.1	<0.1	<0.1
Nickel	mg/kg	24	10	17
Zinc	mg/kg	47	21	44

Moisture				
Our Reference		352434-B-8	352434-B-15	352434-B-16
Your Reference	UNITS	TPCL04	HACL02	HACL03
Depth		2.8-2.9	0.05	0-0.1
Date Sampled		23/05/2024	23/05/2024	23/05/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	17/06/2024	17/06/2024	17/06/2024
Date analysed	-	18/06/2024	18/06/2024	18/06/2024
Moisture	%	11	25	6.0

Asbestos ID - materials		
Our Reference	UNITS	352434-B-17
Your Reference		ACM01
Depth		-
Date Sampled		23/05/2024
Type of sample		Material
Date analysed	-	17/06/2024
Mass / Dimension of Sample	-	120x70x2mm
Sample Description	-	Brown fibrous sheet
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected
Trace Analysis	-	[NT]

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
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-020	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-020	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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	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. For soil results:- 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. 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.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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-023	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. 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.

Client Reference: 304001022-115 Huntlee Future Council Lot

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			17/06/2024	[NT]	[NT]	[NT]	[NT]	17/06/2024	[NT]
Date analysed	-			19/06/2024	[NT]	[NT]	[NT]	[NT]	19/06/2024	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	81	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	81	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	82	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	81	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	100	[NT]	[NT]	[NT]	[NT]	86	[NT]

Client Reference: 304001022-115 Huntlee Future Council Lot

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			17/06/2024	[NT]	[NT]	[NT]	[NT]	17/06/2024	[NT]
Date analysed	-			19/06/2024	[NT]	[NT]	[NT]	[NT]	19/06/2024	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	83	[NT]	[NT]	[NT]	[NT]	123	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			17/06/2024	[NT]	[NT]	[NT]	[NT]	17/06/2024	[NT]
Date analysed	-			19/06/2024	[NT]	[NT]	[NT]	[NT]	19/06/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	90	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	88	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			17/06/2024	[NT]	[NT]	[NT]	[NT]	17/06/2024	[NT]
Date analysed	-			19/06/2024	[NT]	[NT]	[NT]	[NT]	19/06/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	112	[NT]	[NT]	[NT]	[NT]	114	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	[NT]
Date extracted	-			17/06/2024	[NT]	[NT]	[NT]	[NT]	17/06/2024	[NT]
Date analysed	-			19/06/2024	[NT]	[NT]	[NT]	[NT]	19/06/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	134	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	112	[NT]	[NT]	[NT]	[NT]	114	[NT]

Client Reference: 304001022-115 Huntlee Future Council Lot

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			18/06/2024	[NT]	[NT]	[NT]	[NT]	18/06/2024	[NT]
Date analysed	-			19/06/2024	[NT]	[NT]	[NT]	[NT]	19/06/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	91	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	93	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	92	[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.

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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.

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Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

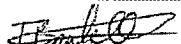
CHAIN OF CUSTODY RECORD



Laboratory:	EnviroLab	Client:	Stantec Australia Pty Ltd
Address:	12 Ashley St Chatswood, NSW 2067	Address:	Suite 2, Level 2, 22 Honeysuckle Drive Newcastle, NSW 2300
Contact:	Ted Bartlett	Results to:	edward.bartlett@stantec.com
Ph:	0401 611 435	Invoice to:	brock.collinson@cardno.com.au
Email:	edward.bartlett@stantec.com	Invoice to:	sapinvoices@stantec.com
Project:	Huntlee Future Council Lot	Date Results Required:	Standard TAT
Project Ref:	304001022-115		
Sampled by:	Brock Collinson		

All samples chilled and/or frozen immediately following sampling.
Please retain all samples for further SCr and contamination testing.

Lab ID	Client Sample ID	Date Sampled	Matrix	Containers / Preservation					TRH Silica Gel Cleanup		
			Soil	Soil Jar	Zip Lock						
352434-B-8	TPCL04 2.8-2.9m	23/05/2024	x	x					x		
352434-B-15	HACL02 0.05m	23/05/2024	x	x					x		

Relinquished by Ted Bartlett Signature  Date/Time 1/07/2024

Received by A-BU1 Signature  Date/Time 1/7/24 1344

352434-C

CERTIFICATE OF ANALYSIS 352434-C

Client Details

Client	Stantec Newcastle
Attention	Edward Bartlett
Address	Suite 2, Level 2, 22 Honeysuckle Drive, NEWCASTLE, NSW, 2300

Sample Details

Your Reference	<u>304001022-115 Huntlee Future Council Lot</u>
Number of Samples	Additional analysis
Date samples received	28/05/2024
Date completed instructions received	01/07/2024

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.

Report Details

Date results requested by	08/07/2024
Date of Issue	05/07/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Dragana Tomas, Senior Chemist
 Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

sTPH in Soil (C10-C40)-Silica			
Our Reference		352434-C-8	352434-C-15
Your Reference	UNITS	TPCL04	HACL02
Depth		2.8-2.9	0.05
Date Sampled		23/05/2024	23/05/2024
Type of sample		Soil	Soil
Date extracted	-	02/07/2024	02/07/2024
Date analysed	-	05/07/2024	05/07/2024
TPH C ₁₀ - C ₁₄	mg/kg	<50	<50
TPH C ₁₅ - C ₂₈	mg/kg	190	<100
TPH C ₂₉ - C ₃₆	mg/kg	<100	<100
TPH >C ₁₀ -C ₁₆	mg/kg	54	<50
TPH >C ₁₆ -C ₃₄	mg/kg	210	<100
TPH >C ₃₄ -C ₄₀	mg/kg	<100	<100
Surrogate 1-Chlorooctadecane	%	92	89

Method ID	Methodology Summary
Org-020	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.

Client Reference: 304001022-115 Huntlee Future Council Lot

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			02/07/2024	8	02/07/2024	02/07/2024		02/07/2024	[NT]
Date analysed	-			05/07/2024	8	05/07/2024	05/07/2024		05/07/2024	[NT]
TPH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	8	<50	<50	0	94	[NT]
TPH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	8	190	150	24	84	[NT]
TPH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	8	<100	<100	0	133	[NT]
TPH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	8	54	<50	8	94	[NT]
TPH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	8	210	160	27	84	[NT]
TPH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	8	<100	<100	0	133	[NT]
Surrogate 1-Chlorooctadecane	%		Org-020	79	8	92	90	2	93	[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
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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.

CHAIN OF CUSTODY RECORD



LAB Name

Envirolab

Address/s

12 Ashley Street, Chatswood, 2067, NSW

Client Address

Stantec Australia Pty Ltd
Suite 2 Level 2, 22 Honeysuckle Drive
Newcastle NSW 2300

Contact

Ted Bartlett

Sampled by

Ted Bartlett

Project Ref:

304001022-115

Contact Numbers

Mob

0401 611 435

Direct Line

4940 4128

E-mail Results:

edward.bartlett@stantec.com

Date Results Required

Standard TAT

Notes:
Invoices to be sent to edward.bartlett@stantec.com and sapinvoices@stantec.com
Sample chilled immediately following sampling.

Silica Gel Cleanup only to be undertaken where TRH concentrations in exceedance of laboratory reporting limits.

Laboratory ID	Client Sample ID	Sample Depth	Date Sampled	Matrix		Containers/Preservation										Analysis Required						
				Soil	Water	Soil Jar (G) Nat. Orange	Purple JAR	Orange Jar	50mL VOA Vial (G) H ₂ SO ₄ Maroon	0.1-1.0 litre (P) H ₂ SO ₄ Maroon	0.2-1.0 litre (G) H ₂ SO ₄ Maroon	0.1-0.2 (P) Filled?? Y=Yes, N=No (HNO3) Red	0.2l (P) NaOH Blue	Other	CS006: Combo 6 TRH/BTEX/N/PAH/OC/PO PP/PCB/8 Metals	Silica Gel Clean Up (TRH C10-C40) - See Note	Additional Metals: Selenium	Hold				
1	ES-CL01	0.05 - 0.1 m	29/10/2024	X		X									X	X						

Relinquished by

Ted Bartlett

Signature

Date/Time

31/10/2024

Received by

G. Wilton

Signature

Date/Time

1/11/24 10:00

Custody Seals Intact? / Samples Received Chilled?

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 365352

Date Received: 1/11/24

Time Received: 11:00

Received By: CW

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

CERTIFICATE OF ANALYSIS 365352

Client Details

Client	Stantec Newcastle
Attention	Edward Bartlett
Address	Suite 2, Level 2, 22 Honeysuckle Drive, NEWCASTLE, NSW, 2300

Sample Details

Your Reference	<u>304001022-115</u>
Number of Samples	1 Soil
Date samples received	01/11/2024
Date completed instructions received	01/11/2024

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.

Report Details

Date results requested by	08/11/2024
Date of Issue	07/11/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Dragana Tomas, Senior Chemist
 Giovanni Agosti, Group Technical Manager
 Jack Wallis, Senior Chemist
 Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

svTRH (C10-C40) in Soil NEPM Silica gel		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	07/11/2024
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	<50
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	<100
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	<100
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	<50
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	<100
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	<100
Surrogate 1-Chlorooctadecane	%	103

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	04/11/2024
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	89

svTRH (C10-C40) in Soil		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	120
TRH C ₂₉ - C ₃₆	mg/kg	170
Total +ve TRH (C10-C36)	mg/kg	300
TRH >C ₁₀ -C ₁₆	mg/kg	56
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	56
TRH >C ₁₆ -C ₃₄	mg/kg	220
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	280
Surrogate o-Terphenyl	%	96

PAHs in Soil		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	76

Organochlorine Pesticides in soil		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	101

Organophosphorus Pesticides in Soil		
Our Reference	UNITS	365352-1
Your Reference		ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	101

PCBs in Soil		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-Fluorobiphenyl	%	92

Acid Extractable metals in soil		
Our Reference		365352-1
Your Reference	UNITS	ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	05/11/2024
Date analysed	-	05/11/2024
Arsenic	mg/kg	9
Cadmium	mg/kg	<0.4
Chromium	mg/kg	14
Copper	mg/kg	6
Lead	mg/kg	13
Mercury	mg/kg	<0.1
Nickel	mg/kg	3
Zinc	mg/kg	19

Moisture		
Our Reference	UNITS	365352-1
Your Reference		ES-CL01
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	04/11/2024
Date analysed	-	05/11/2024
Moisture	%	5.7

Method ID	Methodology Summary
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-020	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-020	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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	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. For soil results:- 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. 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.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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-023	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. 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.

QUALITY CONTROL: svTRH (C10-C40) in Soil NEPM Silica gel					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			07/11/2024	[NT]	[NT]	[NT]	[NT]	07/11/2024	[NT]
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 1-Chlorooctadecane	%		Org-020	98	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	99	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	89	[NT]	[NT]	[NT]	[NT]	91	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	91	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			06/11/2024	[NT]	[NT]	[NT]	[NT]	06/11/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	122	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	97	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			06/11/2024	[NT]	[NT]	[NT]	[NT]	06/11/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			06/11/2024	[NT]	[NT]	[NT]	[NT]	06/11/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			06/11/2024	[NT]	[NT]	[NT]	[NT]	06/11/2024	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	96	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

CHAIN OF CUSTODY RECORD



LAB Name	EnviroLab
Address/s	12 Ashley Street, Chatswood, 2067, NSW

Client Address	Stantec Australia Pty Ltd Suite 2 Level 2, 22 Honeysuckle Drive Newcastle NSW 2300
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Contact Numbers	
Mob	0401 611 435
Direct Line	4940 4128

Contact	Ted Bartlett
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E-mail Results:	edward.bartlett@stantec.com
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Sampled by	Ted Bartlett
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Date Results Required	Standard TAT
------------------------------	--------------

Project Ref:	304001022-115
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Notes:
Invoices to be sent to edward.bartlett@stantec.com and sapinvoices@stantec.com
Sample chilled immediately following sampling.

Silica Gel Cleanup only to be undertaken where TRH concentrations in exceedance of laboratory reporting limits.

Laboratory ID	Client Sample ID	Sample Depth	Date Sampled	Matrix		Containers/Preservation										Analysis Required					
				Soil	Water	Soil Jar (G) Nat. Orange	Purple JAR	Orange Jar	50mL VOA Vial (G) H ₂ SO ₄ Maroon	0.1-1.0 litre (P) H ₂ SO ₄ Maroon	0.2-1.0 litre (G) H ₂ SO ₄ Maroon	0.1-0.2 (P) Filtered?? Y=Yes, N=No (HNO ₃) Red	0.2l (P) NaOH Blue	Other	CS006: Combo 6 TRH/BTEX/N/PAH/OC/PO PP/PCB/8 Metals	Silica Gel Clean Up (TRH C10-C40) - See Note	Additional Metals: Selenium	Hold			
	ES-CL02	0.05 - 0.1 m	29/10/2024	X		X								X	X						

Relinquished by Ted Bartlett

Signature

Date/Time 31/10/2024

Received by

Signature

Date/Time 1/11/24 1100 Custody Seals Intact? / Samples Received Chilled?



EnviroLab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 365351

Date Received: 1/11/24

Time Received: 1100

Received By:

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

CERTIFICATE OF ANALYSIS 365351

Client Details

Client	Stantec Newcastle
Attention	Edward Bartlett
Address	Suite 2, Level 2, 22 Honeysuckle Drive, NEWCASTLE, NSW, 2300

Sample Details

Your Reference	<u>304001022-115</u>
Number of Samples	1 Soil
Date samples received	01/11/2024
Date completed instructions received	01/11/2024

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.

Report Details

Date results requested by	08/11/2024
Date of Issue	07/11/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Jack Wallis, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

svTRH (C10-C40) in Soil NEPM Silica gel		
Our Reference		365351-1
Your Reference	UNITS	ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	07/11/2024
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	<50
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	100
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	<100
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	<50
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	120
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	100
Surrogate 1-Chlorooctadecane	%	99

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		365351-1
Your Reference	UNITS	ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	87

svTRH (C10-C40) in Soil		
Our Reference		365351-1
Your Reference	UNITS	ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	280
TRH C ₂₉ - C ₃₆	mg/kg	150
Total +ve TRH (C10-C36)	mg/kg	420
TRH >C ₁₀ -C ₁₆	mg/kg	70
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	70
TRH >C ₁₆ -C ₃₄	mg/kg	370
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	440
Surrogate o-Terphenyl	%	112

PAHs in Soil		
Our Reference		365351-1
Your Reference	UNITS	ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.4
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.5
Pyrene	mg/kg	0.3
Benzo(a)anthracene	mg/kg	0.2
Chrysene	mg/kg	0.3
Benzo(b,j+k)fluoranthene	mg/kg	0.3
Benzo(a)pyrene	mg/kg	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	2.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	97

Organochlorine Pesticides in soil		
Our Reference	UNITS	365351-1
Your Reference		ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	104

Organophosphorus Pesticides in Soil		
Our Reference	UNITS	365351-1
Your Reference		ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	104

PCBs in Soil		
Our Reference		365351-1
Your Reference	UNITS	ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-Fluorobiphenyl	%	96

Acid Extractable metals in soil		
Our Reference		365351-1
Your Reference	UNITS	ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	05/11/2024
Date analysed	-	05/11/2024
Arsenic	mg/kg	8
Cadmium	mg/kg	<0.4
Chromium	mg/kg	10
Copper	mg/kg	7
Lead	mg/kg	12
Mercury	mg/kg	<0.1
Nickel	mg/kg	7
Zinc	mg/kg	21

Moisture		
Our Reference	UNITS	365351-1
Your Reference		ES-CL02
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	04/11/2024
Date analysed	-	05/11/2024
Moisture	%	8.7

Method ID	Methodology Summary
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-020	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-020	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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	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. For soil results:- 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. 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.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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-023	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. 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.

QUALITY CONTROL: svTRH (C10-C40) in Soil NEPM Silica gel					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			07/11/2024	[NT]	[NT]	[NT]	[NT]	07/11/2024	[NT]
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 1-Chlorooctadecane	%		Org-020	98	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	87	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	97	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	91	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	122	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	97	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	96	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date prepared	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

CHAIN OF CUSTODY RECORD



LAB Name	Envirolab
Address/s	12 Ashley Street, Chatswood, 2067, NSW

Client Address	Stantec Australia Pty Ltd Suite 2 Level 2, 22 Honeysuckle Drive Newcastle NSW 2300
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Contact Numbers	
Mob	0401 611 435
Direct Line	4940 4128

Contact	Ted Bartlett
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E-mail Results:	edward.bartlett@stantec.com
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Sampled by	Ted Bartlett
-------------------	--------------

Date Results Required	Standard TAT
------------------------------	--------------

Project Ref:	304001022-115
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Notes:
Invoices to be sent to edward.bartlett@stantec.com and sapinvoices@stantec.com
Sample chilled immediately following sampling.

Silica Gel Cleanup only to be undertaken where TRH concentrations in exceedance of laboratory reporting limits.

Laboratory ID	Client Sample ID	Sample Depth	Date Sampled	Matrix		Containers/Preservation										Analysis Required					
				Soil	Water	Soil Jar (G) Net Orange	Purple JAR	Orange Jar	50mL VOA Vial (G) H ₂ SO ₄ Maroon	0.1-1.0 litre (P) H ₂ SO ₄ Maroon	0.2-1.0 litre (G) H ₂ SO ₄ Maroon	0.1-0.2 (P) Filtered?? Y=Yes, N=No (HNO3) Red	0.2l (P) NaOH Blue	Other	CS006: Combo 6 TRH/BTEXN/PAH/OC/PO PP/PCB/8 Metals	Silica Gel Clean Up (TRH C10-C40) - See Note	Additional Metals: Selenium	Hold			
1	ES-CL03	0.05 - 0.1 m	29/10/2024	X		X								X	X	X					

Relinquished by Ted Bartlett

Signature *Ted Bartlett*

Date/Time 31/10/2024

Received by *O. Wilton*

Signature *O-W*

Date/Time 1/11/24 1100 Custody Seals Intact? / Samples Received Chilled?

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 365350
Date Received: 1/11/24
Time Received: 1100
Received By: *CW*
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

CERTIFICATE OF ANALYSIS 365350

Client Details

Client	Stantec Newcastle
Attention	Edward Bartlett
Address	Suite 2, Level 2, 22 Honeysuckle Drive, NEWCASTLE, NSW, 2300

Sample Details

Your Reference	<u>304001022-115</u>
Number of Samples	1 Soil
Date samples received	01/11/2024
Date completed instructions received	01/11/2024

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	08/11/2024
Date of Issue	07/11/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Dragana Tomas, Senior Chemist
 Giovanni Agosti, Group Technical Manager
 Jack Wallis, Senior Chemist
 Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

svTRH (C10-C40) in Soil NEPM Silica gel		
Our Reference	UNITS	365350-1
Your Reference		ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	56
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	250
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	<100
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	82
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	290
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	<100
Surrogate 1-Chlorooctadecane	%	92

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		365350-1
Your Reference	UNITS	ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	80

svTRH (C10-C40) in Soil		
Our Reference		365350-1
Your Reference	UNITS	ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₁₀ - C ₁₄	mg/kg	120
TRH C ₁₅ - C ₂₈	mg/kg	700
TRH C ₂₉ - C ₃₆	mg/kg	340
Total +ve TRH (C10-C36)	mg/kg	1,200
TRH >C ₁₀ -C ₁₆	mg/kg	170
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	170
TRH >C ₁₆ -C ₃₄	mg/kg	900
TRH >C ₃₄ -C ₄₀	mg/kg	190
Total +ve TRH (>C10-C40)	mg/kg	1,300
Surrogate o-Terphenyl	%	#

PAHs in Soil		
Our Reference		365350-1
Your Reference	UNITS	ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.6
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.8
Pyrene	mg/kg	0.4
Benzo(a)anthracene	mg/kg	0.3
Chrysene	mg/kg	0.5
Benzo(b,j+k)fluoranthene	mg/kg	0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	2.8
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	67

Organochlorine Pesticides in soil		
Our Reference		365350-1
Your Reference	UNITS	ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	99

Organophosphorus Pesticides in Soil		
Our Reference	UNITS	365350-1
Your Reference		ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	99

PCBs in Soil		
Our Reference		365350-1
Your Reference	UNITS	ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-Fluorobiphenyl	%	88

Acid Extractable metals in soil		
Our Reference		365350-1
Your Reference	UNITS	ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	05/11/2024
Date analysed	-	05/11/2024
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	1
Copper	mg/kg	5
Lead	mg/kg	19
Mercury	mg/kg	0.1
Nickel	mg/kg	3
Zinc	mg/kg	5
Selenium	mg/kg	<2

Moisture		
Our Reference	UNITS	365350-1
Your Reference		ES-CL03
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	04/11/2024
Date analysed	-	05/11/2024
Moisture	%	10

Method ID	Methodology Summary
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-020	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-020	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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	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. For soil results:- 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. 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.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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-023	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. 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.

QUALITY CONTROL: svTRH (C10-C40) in Soil NEPM Silica gel					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 1-Chlorooctadecane	%		Org-020	98	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	87	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	97	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	91	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	91	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	122	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	96	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Selenium	mg/kg	2	Metals-020	<2	[NT]	[NT]	[NT]	[NT]	97	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate is not possible to report as the high concentration of analytes in sample 365350-1 have caused interference.

CHAIN OF CUSTODY RECORD



LAB Name	EnviroLab
Address/s	12 Ashley Street, Chatswood, 2067, NSW

Client Address	Stantec Australia Pty Ltd Suite 2 Level 2, 22 Honeysuckle Drive Newcastle NSW 2300
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Contact Numbers	
Mob	0401 611 435
Direct Line	4940 4128

Contact	Ted Bartlett
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E-mail Results:	edward.bartlett@stantec.com
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Sampled by	Ted Bartlett
-------------------	--------------

Date Results Required	Standard TAT
------------------------------	--------------

Project Ref:	304001022-115
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Notes:
Invoices to be sent to edward.bartlett@stantec.com and sapinvoices@stantec.com
Sample chilled immediately following sampling.

Silica Gel Cleanup only to be undertaken where TRH concentrations in exceedance of laboratory reporting limits.

Laboratory ID	Client Sample ID	Sample Depth	Date Sampled	Matrix		Containers/Preservation										Analysis Required					
				Soil	Water	Soil Jar (G) Nat. Orange	Purple JAR	Orange Jar	50mL VOA Vial (G) H ₂ SO ₄ Maroon	0.1-1.0 litre (P) H ₂ SO ₄ Maroon	0.2-1.0 litre (G) H ₂ SO ₄ Maroon	0.1-0.2 (P) Filtered?? Y=Yes, N=No (HNC3) Red	0.2l (P) NaOH Blue	Other	CS006: Combo 6 TRH/BTEXN/PAH/OC/PO PP/PCB/6 Metals	Silica Gel Clean Up (TRH C10-C40) - See Note	Additional Metals: Selenium	Hold			
1	ES-CL04	0.05 - 0.1 m	29/10/2024	X		X								X	X	X					

Relinquished by Ted Bartlett

Signature

Date/Time 31/10/2024

Received by

Signature O-W

Date/Time 1/11/24 1100

Custody Seals Intact? / Samples Received Chilled?



EnviroLab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 365349

Date Received: 1/11/24

Time Received: 1100

Received By:

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

CERTIFICATE OF ANALYSIS 365349

Client Details

Client	Stantec Newcastle
Attention	Edward Bartlett
Address	Suite 2, Level 2, 22 Honeysuckle Drive, NEWCASTLE, NSW, 2300

Sample Details

Your Reference	<u>304001022-115</u>
Number of Samples	1 Soil
Date samples received	01/11/2024
Date completed instructions received	01/11/2024

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.

Report Details

Date results requested by	08/11/2024
Date of Issue	07/11/2024
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Jack Wallis, Senior Chemist
Timothy Toll, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

svTRH (C10-C40) in Soil NEPM Silica gel		
Our Reference	UNITS	365349-1
Your Reference		ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	07/11/2024
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	<50
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	160
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	<100
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	<50
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	190
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	<100
Surrogate 1-Chlorooctadecane	%	132

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		365349-1
Your Reference	UNITS	ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	84

svTRH (C10-C40) in Soil		
Our Reference		365349-1
Your Reference	UNITS	ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	05/11/2024
TRH C ₁₀ - C ₁₄	mg/kg	54
TRH C ₁₅ - C ₂₈	mg/kg	300
TRH C ₂₉ - C ₃₆	mg/kg	200
Total +ve TRH (C10-C36)	mg/kg	550
TRH >C ₁₀ -C ₁₆	mg/kg	76
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	76
TRH >C ₁₆ -C ₃₄	mg/kg	420
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	500
Surrogate o-Terphenyl	%	134

PAHs in Soil		
Our Reference		365349-1
Your Reference	UNITS	ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Naphthalene	mg/kg	0.2
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.5
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.3
Pyrene	mg/kg	0.2
Benzo(a)anthracene	mg/kg	0.1
Chrysene	mg/kg	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	1.5
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	76

Organochlorine Pesticides in soil		
Our Reference		365349-1
Your Reference	UNITS	ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	101

Organophosphorus Pesticides in Soil		
Our Reference	UNITS	365349-1
Your Reference		ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	101

PCBs in Soil		
Our Reference		365349-1
Your Reference	UNITS	ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date extracted	-	04/11/2024
Date analysed	-	06/11/2024
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-Fluorobiphenyl	%	90

Acid Extractable metals in soil		
Our Reference		365349-1
Your Reference	UNITS	ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	05/11/2024
Date analysed	-	05/11/2024
Arsenic	mg/kg	4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	9
Copper	mg/kg	14
Lead	mg/kg	10
Mercury	mg/kg	0.1
Nickel	mg/kg	24
Zinc	mg/kg	28
Selenium	mg/kg	<2

Moisture		
Our Reference	UNITS	365349-1
Your Reference		ES-CL04
Depth		0.05-1m
Date Sampled		29/10/2024
Type of sample		Soil
Date prepared	-	04/11/2024
Date analysed	-	05/11/2024
Moisture	%	4.6

Method ID	Methodology Summary
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-020	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-020	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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	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. For soil results:- 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. 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.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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-023	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. 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.

QUALITY CONTROL: svTRH (C10-C40) in Soil NEPM Silica gel					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			07/11/2024	[NT]	[NT]	[NT]	[NT]	07/11/2024	[NT]
TRH (Silica) C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH (Silica) >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH (Silica) >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH (Silica) >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
Surrogate 1-Chlorooctadecane	%		Org-020	98	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	87	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	97	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	91	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-020	91	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	122	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	104	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			04/11/2024	[NT]	[NT]	[NT]	[NT]	04/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	96	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	[NT]
Date prepared	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Date analysed	-			05/11/2024	[NT]	[NT]	[NT]	[NT]	05/11/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Selenium	mg/kg	2	Metals-020	<2	[NT]	[NT]	[NT]	[NT]	97	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

APPENDIX

E

ANALYTICAL TABLES

	BTEX							Asbestos Identification in Soil
	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Naphthalene (VOC)	Asbestos fibres
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g/kg
EQL	0.2	0.5	1	2	1	1	1	
NEPM 2013 Sch B1 Table 7 Asbestos HSLs								1
CRC CARE 2011 Soil HSL for Direct Contact, HSL-A Residential	100	14,000	4,500			12,000		
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged								
NEPM 2013 ESL UR/POS, Coarse Soil	50	85	70			105		
NEPM 2013 HIL, Residential A								
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand	0.5 0.5 0.5 0.5	160 220 310 540	55			40 60 95 170		

Field ID	Matrix Type	Depth	Date	Matrix Description	Report No.								
ACM01	Fragment		23 May 2024	Fibrous pipe lining / coating	352434-B								1
HACL02	Soil	0.05 - 0.1	23 May 2024	Topsoil: Silty Clayey SAND, dark brown, abundant organics	352434-B	<0.2	<0.5	<1	<2	<1	<1	<1	
HACL03	Soil	0 - 0.1	23 May 2024	Slopewash: Gravelly SAND, pale brown and red (derived from exposed bedrock upslope)	352434-B	<0.2	<0.5	<1	<2	<1	<1	<1	
ES-CL01	Soil	0.05 - 0.1	29 Oct 2024	Fill berm: Gravelly Clayey SAND, brown (overburden weathered rock materials)	365352	<0.2	<0.5	<1	<2	<1	<1	<1	
ES-CL02	Soil	0.05 - 0.1	29 Oct 2024	Topsoil/Slopewash: Silty SAND, dark brown to grey-brown, abundant organics (root fibres)	365351	<0.2	<0.5	<1	<2	<1	<1	<1	
ES-CL03	Soil	0.05 - 0.1	29 Oct 2024	Surficial CWR fines: Silty SAND, black to dark grey, minor organics (root fibres)	365350	<0.2	<0.5	<1	<2	<1	<1	<1	
ES-CL04	Soil	0.05 - 0.1	29 Oct 2024	Fill mound/pile: Silty SAND, grey-brown, with gravel, some organics, trace coarse CWR fragments (predominant overburden topsoil/colluvium)	365349	<0.2	<0.5	<1	<2	<1	<1	<1	
TPCL04	Soil	2.8 - 2.9	23 May 2024	Coarse CWR fill embankment: Sandy GRAVEL, black, with clay/silt	352434-B	<0.2	<0.5	<1	<2	<1	<1	<1	

	CRC Care TPH Fractions									
	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less Naphthalene	>C10 - C16 Fraction (SG)	>C16 - C34 Fraction (SG)	>C34 - C40 Fraction (SG)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	25	50	100	100	50	25	50	50	100	100
NEPM 2013 Sch B1 Table 7 Asbestos HSLs										
CRC CARE 2011 Soil HSL for Direct Contact, HSL-A Residential	4,400	3,300	4,500	6,300				3,300	4,500	6,300
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged										
NEPM 2013 ESL UR/POS, Coarse Soil		120	300	2,800		180		120	300	2,800
NEPM 2013 HIL, Residential A										
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand						45 70 110 200	110 240 440	110		

Field ID	Matrix Type	Depth	Date	Matrix Description	Report No.									
ACM01	Fragment		23 May 2024	Fibrous pipe lining / coating	352434-B									
HACL02	Soil	0.05 - 0.1	23 May 2024	Topsoil: Silty Clayey SAND, dark brown, abundant organics	352434-B	<25	64	400	170	640	<25	64	<50	<100
HACL03	Soil	0 - 0.1	23 May 2024	Slopewash: Gravelly SAND, pale brown and red (derived from exposed bedrock upslope)	352434-B	<25	<50	<100	<100	<50	<25	<50		
ES-CL01	Soil	0.05 - 0.1	29 Oct 2024	Fill berm: Gravelly Clayey SAND, brown (overburden weathered rock materials)	365352	<25	56	220	<100	280	<25	56	<50	<100
ES-CL02	Soil	0.05 - 0.1	29 Oct 2024	Topsoil/Slopewash: Silty SAND, dark brown to grey-brown, abundant organics (root fibres)	365351	<25	70	370	<100	440	<25	70	<50	120
ES-CL03	Soil	0.05 - 0.1	29 Oct 2024	Surficial CWR fines: Silty SAND, black to dark grey, minor organics (root fibres)	365350	<25	170	900	190	1,300	<25	170	82	290
ES-CL04	Soil	0.05 - 0.1	29 Oct 2024	Fill mound/pile: Silty SAND, grey-brown, with gravel, some organics, trace coarse CWR fragments (predominant overburden topsoil/colluvium)	365349	<25	76	420	<100	500	<25	76	<50	190
TPCL04	Soil	2.8 - 2.9	23 May 2024	Coarse CWR fill embankment: Sandy GRAVEL, black, with clay/silt	352434-B	<25	110	580	<100	700	<25	110	54	210

	PAH																	
	Benzol(b,j+k)fluoranthene	Benzo(a)pyrene TEQ (half LOR)	Benzo(a)pyrene TEQ (upper bound) *	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	BaP TEQ (zero)	Benzo(a)pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.2	0.5	0.5	0.1	0.1	0.1	0.1	0.5	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Sch B1 Table 7 Asbestos HSLs																		
CRC CARE 2011 Soil HSL for Direct Contact, HSL-A Residential																1,400		
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged																170		
NEPM 2013 ESL UR/POS, Coarse Soil									0.7									
NEPM 2013 HIL, Residential A		3	3					3										
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand																3		

Field ID	Matrix Type	Depth	Date	Matrix Description	Report No.																		
ACM01	Fragment		23 May 2024	Fibrous pipe lining / coating	352434-B																		
HACL02	Soil	0.05 - 0.1	23 May 2024	Topsoil: Silty Clayey SAND, dark brown, abundant organics	352434-B	0.2	<0.5	<0.5	<0.1	<0.1	<0.1	0.2	<0.5	0.05	<0.1	0.2	<0.1	0.4	<0.1	<0.1	<0.1	0.2	0.2
HACL03	Soil	0 - 0.1	23 May 2024	Slopewash: Gravelly SAND, pale brown and red (derived from exposed bedrock upslope)	352434-B	<0.2	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.05	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.1
ES-CL01	Soil	0.05 - 0.1	29 Oct 2024	Fill berm: Gravelly Clayey SAND, brown (overburden weathered rock materials)	365352	<0.2	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ES-CL02	Soil	0.05 - 0.1	29 Oct 2024	Topsoil/Slopewash: Silty SAND, dark brown to grey-brown, abundant organics (root fibres)	365351	0.3	<0.5	<0.5	<0.1	<0.1	<0.1	0.2	<0.5	0.09	<0.1	0.3	<0.1	0.5	<0.1	<0.1	<0.1	0.4	0.3
ES-CL03	Soil	0.05 - 0.1	29 Oct 2024	Surficial CWR fines: Silty SAND, black to dark grey, minor organics (root fibres)	365350	0.2	<0.5	<0.5	<0.1	<0.1	<0.1	0.3	<0.5	<0.05	<0.1	0.5	<0.1	0.8	<0.1	<0.1	<0.1	0.6	0.4
ES-CL04	Soil	0.05 - 0.1	29 Oct 2024	Fill mound/pile: Silty SAND, grey-brown, with gravel, some organics, trace coarse CWR fragments (predominant overburden topsoil/colluvium)	365349	<0.2	<0.5	<0.5	<0.1	<0.1	<0.1	0.1	<0.5	<0.05	<0.1	0.2	<0.1	0.3	<0.1	<0.1	0.2	0.5	0.2
TPCL04	Soil	2.8 - 2.9	23 May 2024	Coarse CWR fill embankment: Sandy GRAVEL, black, with clay/silt	352434-B	0.5	<0.5	<0.5	<0.1	<0.1	<0.1	0.3	<0.5	0.06	0.1	0.5	<0.1	1.2	<0.1	<0.1	0.8	1.3	0.6

	Metals									
	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Nickel (filtered)	Selenium	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg
EQL	4	0.4	1	1	1	0.1	1	0.02	2	1
NEPM 2013 Sch B1 Table 7 Asbestos HSLs										
CRC CARE 2011 Soil HSL for Direct Contact, HSL-A Residential										
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged	100		190	60	1,100		30			70
NEPM 2013 ESL UR/POS, Coarse Soil										
NEPM 2013 HIL, Residential A	100	20		6,000	300	40	400		200	7,400
NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Sand										

Field ID	Matrix Type	Depth	Date	Matrix Description	Report No.										
ACM01	Fragment		23 May 2024	Fibrous pipe lining / coating	352434-B										
HACL02	Soil	0.05 - 0.1	23 May 2024	Topsoil: Silty Clayey SAND, dark brown, abundant organics	352434-B	6	<0.4	10	8	14	<0.1	10			21
HACL03	Soil	0 - 0.1	23 May 2024	Slopewash: Gravelly SAND, pale brown and red (derived from exposed bedrock upslope)	352434-B	11	<0.4	13	7	6	<0.1	17			44
ES-CL01	Soil	0.05 - 0.1	29 Oct 2024	Fill berm: Gravelly Clayey SAND, brown (overburden weathered rock materials)	365352	9	<0.4	14	6	13	<0.1	3			19
ES-CL02	Soil	0.05 - 0.1	29 Oct 2024	Topsoil/Slopewash: Silty SAND, dark brown to grey-brown, abundant organics (root fibres)	365351	8	<0.4	10	7	12	<0.1	7			21
ES-CL03	Soil	0.05 - 0.1	29 Oct 2024	Surficial CWR fines: Silty SAND, black to dark grey, minor organics (root fibres)	365350	<4	<0.4	1	5	19	0.1	3		<2	5
ES-CL04	Soil	0.05 - 0.1	29 Oct 2024	Fill mound/pile: Silty SAND, grey-brown, with gravel, some organics, trace coarse CWR fragments (predominant overburden topsoil/colluvium)	365349	4	<0.4	9	14	10	0.1	24		<2	28
TPCL04	Soil	2.8 - 2.9	23 May 2024	Coarse CWR fill embankment: Sandy GRAVEL, black, with clay/silt	352434-B	<4	<0.4	8	28	10	0.1	24			47

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